ELECTRICITY ON THE FARM *Magazine*

MARCH
1958

OUR 31st YEAR—THIS ISSUE 862,000 COPIES

Barn Cleaner Heads List ..... PAGE 4

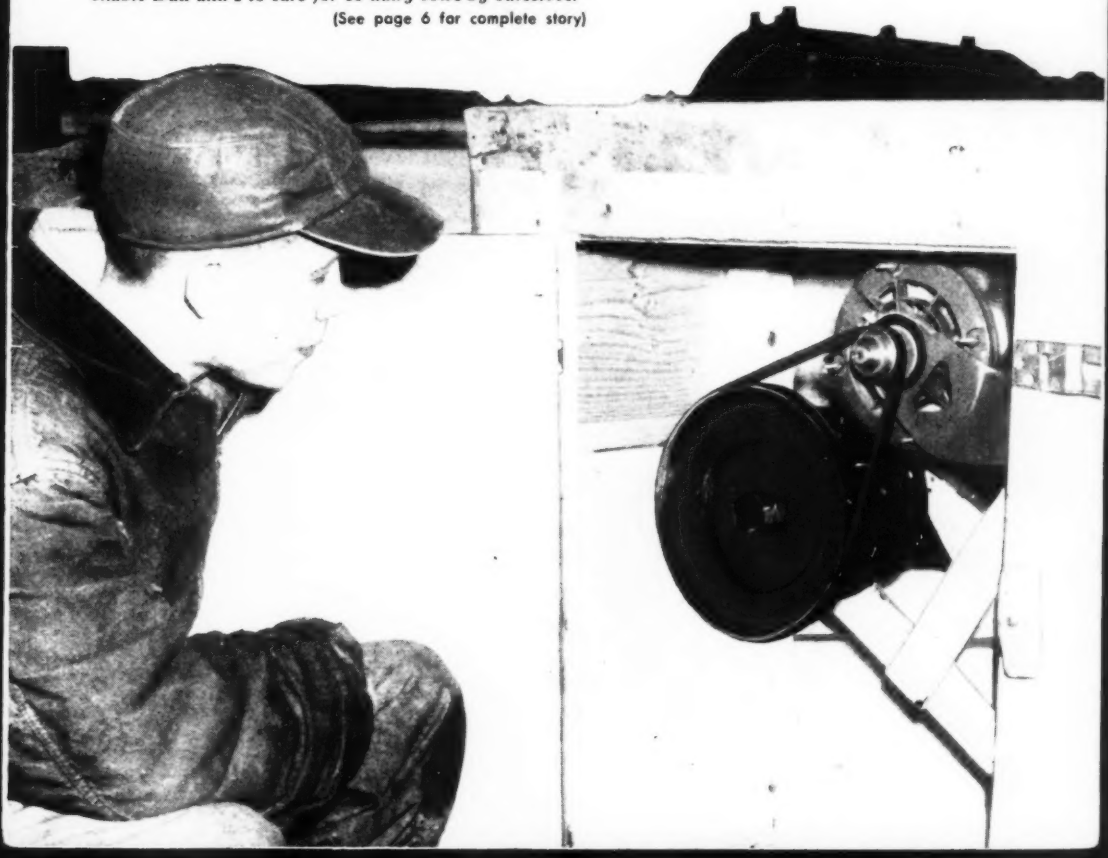
Brood Chicks Better Electrically ..... PAGE 8

Let's Look at Milkhouse Water Heating ..... PAGE 10

Major Appliances for '58 ..... PAGE 22

"Electrical servants like this mechanized feed bunk enable Dad and I to care for 40 dairy cows by ourselves."

(See page 6 for complete story)



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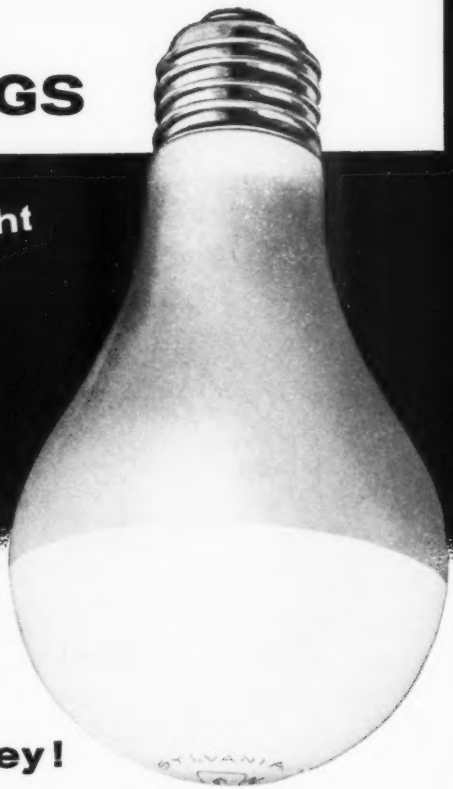

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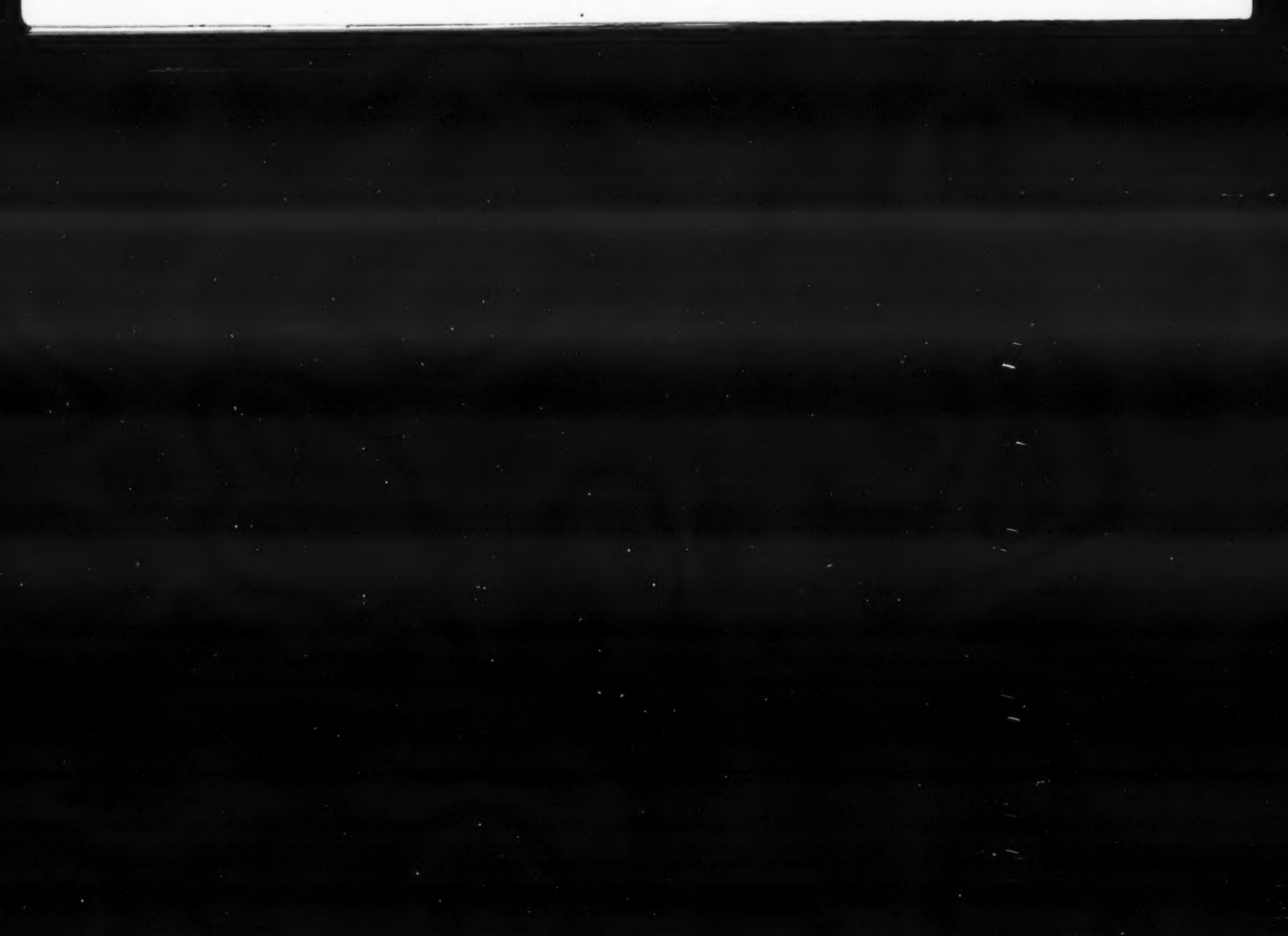

Editor's Chat

CHARLIE'S "GOOD OLD DAYS"

Every so often we hear Charlie longing for the "good old days". Likely as not he's referring to an era some twenty to thirty years ago when he makes such wishful statements.

Next time we hear Charlie making that statement, we might pin him down as to just how "good" they were. A few facts and figures about today will quickly refute him.

For instance, thirty years ago there was one vacuum cleaner for every 14 persons in U.S.; today there's one for every five. Then we had one washing machine to every 18 people, today one for every 4. There was no television then, one set to every five persons today. Barn cleaners, silo unloaders, pipeline milkers and bulk milk tanks were all unknown then; today they are commonplace on many of our modern dairy farms.

Yes, just a few facts and figures of this sort will make Charlie think twice before wishing he could trade today's life of mechanization and electronics for his "good old days".

STUBBING YOUR TOE?

Ever stub your toe real badly? I'm never quite sure which hurts the more—the toe or that feeling of being clumsy. In any case, it's a sign that you're either daydreaming or your path needs more light. Chances are it's the latter.

Whether a hallway in your home or the path to your barn—well lighted walkways cut down potential "stubbed toes" and more serious accidents. But just as important as good lighting are conveniently placed control switches which encourage the use of those lights. Three and four way switches that control the same light from either end of the yard, for instance, reduce accident hazards which could result in lost time, annoyance and other difficulties.

A well lighted farm and home looks friendly and welcoming as well as safe. Brighten up yours with good lighting that can be controlled with a minimum of inconvenience.

BROILERS IN EIGHT WEEKS

The other day a report came out on the ninth "Chicken-of-Tomorrow" contest being held in one of our principle poultry producing states. The report included many interesting facts and figures. One of the more significant was that reporting the decreasing length of time and amount of feed needed to grow the chicks being exhibited in the "Chicken-of-Tomorrow" contest.

When the show was begun nine years ago, the average poultryman needed 12 weeks and 12 to 14 pounds of feed to produce a three-and-one-half-pound broiler. The birds exhibited this year will have been brought to three and one half pounds or more in eight weeks with only about eight pounds of feed.

Better feeding methods and the breeding of poultry for meat production have reduced by one third the length of time and amount of feed needed to grow a broiler. There have been few more spectacular achievements in agriculture. The progress of some other industries may be more widely advertised at times but there are few groups in America that are making better use of better methods than are our nation's farmers.

Jim Ridout

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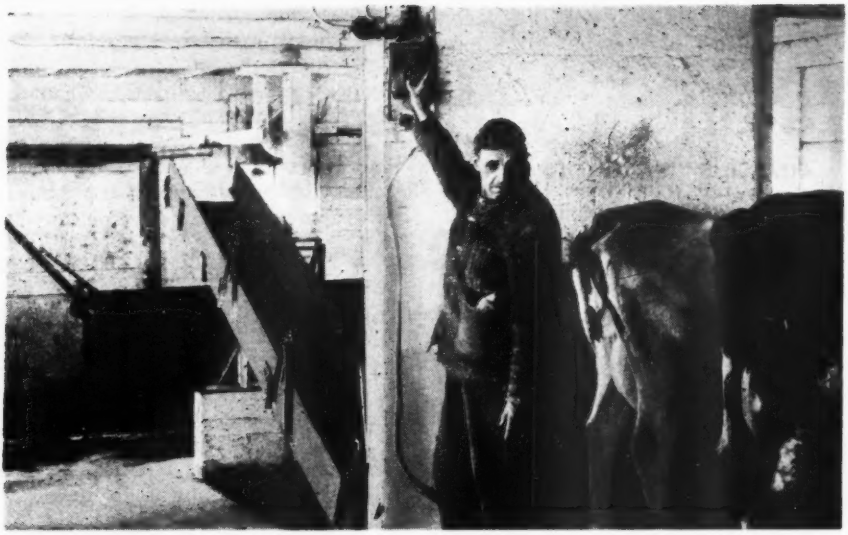


"Most impressive benefit from my barn cleaner is the fact that now I can clean my dairy on Sunday morning and still be to church on time," says Rosenberger. "This was practically impossible before I installed the cleaner."

Barn Cleaner Heads List

Because it reduces choretime 7 man-minutes per cow per day

By O. C. LANGE

In the past twenty years the changes that have taken place on the Aaron Rosenberger dairy farm, Quakertown, Pa., have been typical of those taking place on many of the progressive farms throughout the nation. Twenty years ago the Rosenberger farm consisted of a herd of 20 dairy cows.

Rosenberger recognized that he would have to produce more milk with less labor cost if he intended to remain in business and maintain the standard of living to which he was accustomed. Today the Rosenberger farm has expanded 150% to include 50 milk cows. Through more complete mechanization and electrification of the entire farmstead, Rosenberger states it takes fewer man-hours to care for his present 50 head than he used to spend tending his 20-cow herd.

Many pieces of equipment have been added to the Rosenberger farm that have helped to reduce the work load. Heading the list is the electric barn cleaner which was installed in 1953.

Now the barn is cleaned in 30 minutes with no more effort than pushing a button. The man-hours saved by the cleaner have more than paid for the installation.

Cleans Fast, Does It Neatly

One gutter is 118 feet long and the other is 80 feet. Rosenberger figures that approximately 260 tons of manure are removed from the gutters every year. He doubts very much if he would be able to farm any longer if he had to pitch it on the spreader as he did before.

Another reason for Aaron listing the cleaner at the top of his preference list is that the litter alley is kept much cleaner. When the manure was forked, the alley would become extremely dirty and messy. This required extra time and effort to clean. Now, this problem no longer exists. Then too, less crushed limestone is required to keep the alley in a clean, dry and sanitary condition.

Rosenberger has been farming for 41 years and at the present time he has no intention of retiring. In fact, his plans for the future call for continued growth to keep pace with the new and more productive agricultural practices. With the aid of electrified farm equipment, such as the barn cleaner, he feels he will be able to continue actively running his dairy farm for quite a few more years. □ □

Low Cost Hog Farrowing

Provided by judicious use of heat lamps and available housing facilities

By CURTIS KENNEDY

The money received for a product—minus production costs—represents profit or loss. Naturally, every farmer tries to increase his profit by (1) producing the maximum with a minimum investment in equipment, labor and other production cost items and (2) having a product ready for market when prices are highest.

Prefers Central Farrowing

John Randall, owner and successful operator of "Randallane" farm near Pendleton, Indiana, liked the apparent advantages of central farrowing. He decided to try the idea by utilizing existing buildings on his farm. He did this by simply moving 12 individual farrowing houses into what had previously been a dairy barn.

To convert the abandoned dairy barn into a central farrowing house, all he had to do was supplement the existing lighting and outlet circuits with four additional 15 ampere circuits, each to handle six 250-watt infrared heat lamps.

The Randalls like to farrow during January or February. This enables them to market hogs during the period of high prices. They also have more time then to devote to animals during critical farrowing periods.

Very Good Success In 1957

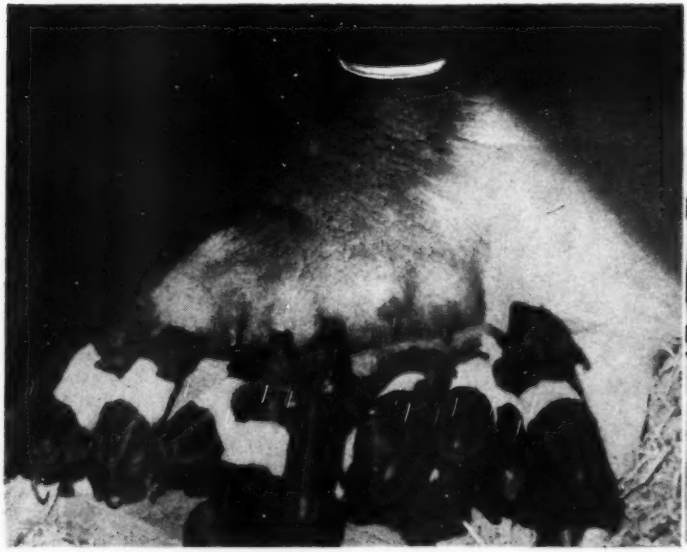
Randalls keep a complete record of all pigs farrowed. Last winter their 72 sows farrowed 660 live pigs. This was an average of 9.1 pigs per sow. Only five of the 660 pigs were killed during the five day period after farrowing.

They attribute this success to the fact that the outside sheathing of the old dairy barn was tight and that the body heat from the 12 to 18 sows plus the infrared radiation from the heat lamps (which were left on almost continuously during the five day period) kept the barn warm and the sows very comfortable. The temperature inside never dropped below 40° F.

Need Ample Heat to Save Pigs

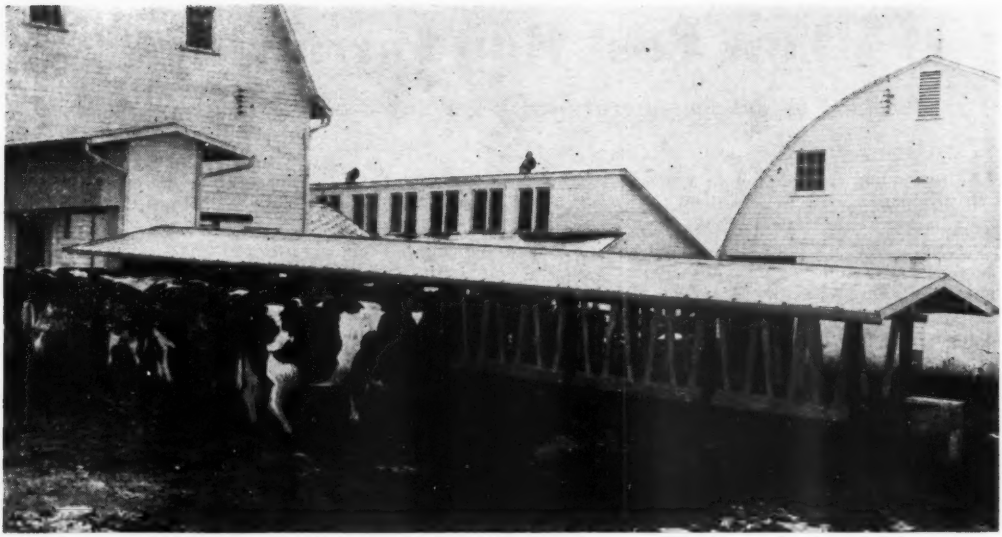
The Randalls have practiced about all known farrowing methods and they think the present system tops them all. They say that the "pigs grow so fast under these conditions they almost burst their skins." Farmers with individual houses located outside can easily duplicate the above conditions.

Their experience clearly proves that in order to save pigs in cold weather, plenty of infrared heat should be given the pigs when needed most. □ □



Infrared lamp is hung above newborn pigs to give them positive protection from chilling during first few crucial hours after birth. Another lamp is hung behind guard rail along back side of pen where pigs are safe from crushing by mother sow.

Randall uses pyrex lens 250-watt infrared lamps in porcelain sockets. Lamps are easily removed and stored.



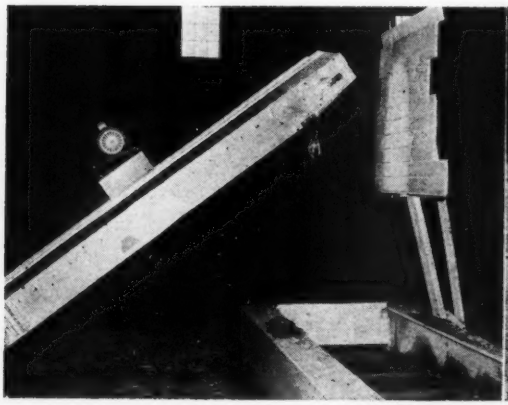
Forage feeding bunker makes for easy choring in converted operation. Forage is distributed evenly over 50 foot length by web conveyor. Although old buildings were not ideally located for mechanized feeding, conveyors and elevators bridged the gaps.

How conveyors helped us to

Expand Without Rebuilding

. . . now our herd is doubled with no added choretime

By LOWELL D. OVERMYER



Conveyors solved the problem of getting silage from silos to feed bunk. This 24 ft. aluminum conveyor powered by a ¾ hp motor carries silage across mow and dumps it onto bunk conveyor.

Hay and silage are carried out to feeder on this conveyor. Web travels 3½ feet per minute and is powered by a ⅓ hp motor. A wagon unloader unit serves as speed reducer.

DIVIDENDS FROM DAIRY VENTILATION

"MY DAIRY VENTILATION system gave me an extra dividend last spring" reports Wayne Thompsette of Sinclairville, N. Y. "Besides doing a good job of keeping my barn dry and fresh, I was able to leave the cows in the barn an extra week during the first warm spell we had. This gave my pasture a chance to get a head start and as a result, I had better pastures all summer long." Thompsette's fans are arranged so that during warm weather both fans remove the warm, stale air at ceiling level.

M. H. LLOYD

Changing farm practices often make farm buildings obsolete, even though they are still structurally sound. They become obsolete because of the high labor requirements needed to use them to capacity.

Manford Hine of Darke County, Ohio was faced with this situation. He had two good barns with accompanying silos. But they were not designed for a modern-day mechanized and efficient operation. The stall barn had room for only 20 cows. The horse barn had been converted to loose housing. But it lacked storage space for hay or bedding.

Chore Patterns Were Altered

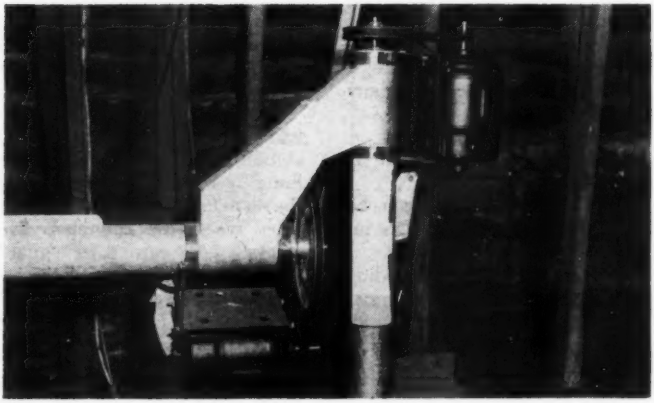
Hine wanted to increase his herd to 40 milk cows—and at the same time reduce the amount of labor required to handle the operation. A survey of the situation revealed he could best do this by making two major changes. These involved installation of an elevated stall milking room and pipeline milker and the addition of a mechanized feed and forage handling system.

The elevated stall milking room was easily installed in one of the barns and proved very satisfactory. Coupled with the pipeline milker, this new setup saved the labor of one man at milking time.

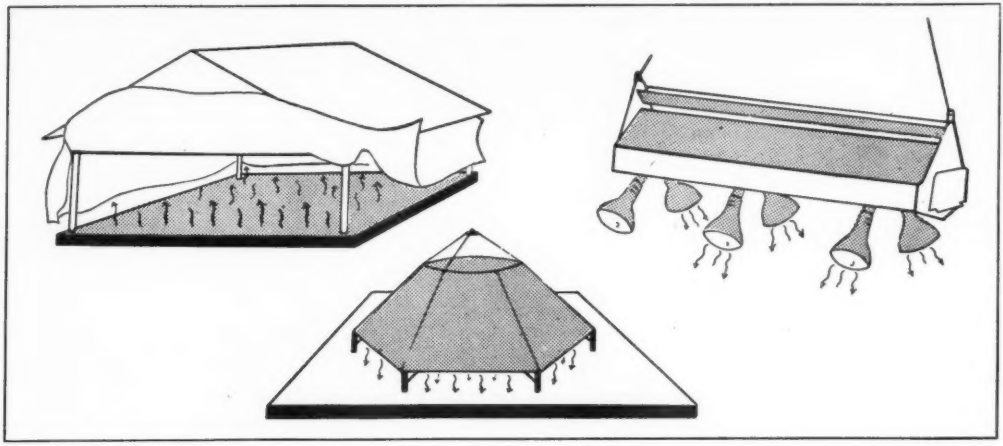
An outdoor paved lot was built for feeding hay and silage. The feed bunk with built-in conveyor was extended into the mow of the old stanchion barn. This permitted its use for both hay and silage as shown in the photographs on the opposite page. The addition of this outside feeding system actually made available storage space for 100 tons that had not been used for several years due to the large amount of labor needed to feed the hay stored in it.

Feed concentrates are now fed while the cows are being milked. The feed is handled entirely by mechanical means as shown in the photo on this page.

An interesting feature of the feed handling system is the use of fractional hp motors. Hines says, "Those little motors sure do the job and in turn save my back. Now my high school son and I are caring for 40 cows with less work than our 20 cow herd required." □ □



Feed is carried from ground level storage to hoppers above milking room by these two augers powered by a ½ hp and a ¾ hp motor. Pressure switch at far left end shuts off auger system when overhead hoppers are full.



There are three ways to

Brood Chicks Better Electrically

One of these clean, odorless, fumeless methods is best for your operation

All baby chicks need warm surroundings during their first few days of life. Whether your operation is just a small family flock or several thousand broilers or future layers, some type of brooding must be provided for them. As a heat source for brooding, electricity is by far the best and most convenient available to you.

Present day electric brooding provides three general methods for the poultryman. Each has some definite advantages over the other two and may be the most desirable for your particular situation. You must weigh these advantages and then determine the type which best fits your particular operation. The following facts will assist you in the decision.

Infrared Lamps

Infrared heat lamps have been used for brooding by poultrymen with large or small operations. Bracket assemblies are available commercially or can be built relatively easily on the farm. Lamps are usually used in clusters up to six or eight for each unit. Various thermostat arrangements are also used. Usually, one or two lamps are on continuously, the others are thermostatically controlled.

Infrared brooding offers several advantages which make it the preferred method by many poultrymen:

- Chicks are in full view at all times
- Desired heat level can be selected by chick to suit its individual needs
- Permits cold room brooding which produces fast feathering, a keen appetite for rapid, healthy growth, and permits adequate ventilation.
- Initial cash investment is very low per chick
- Upkeep costs are low. Lamps are designed to burn up to 5000 hours (ordinary light bulbs are designed for 750-1000 hours)
- Equipment is easy to install or remove

Cost of electrical energy for brooding by this method runs somewhat higher than with the other two methods. USDA has recommended the use of a non-combustible curtain material around the brooder unit to cut operating costs.

Generally, each 250-watt lamp will handle from 60 to 100 chicks. The lamps should be hung by a chain 18 inches above the floor and raised two inches each week for the first five weeks. A cardboard guard around the pen will serve to reduce drafts on the chicks.

Electric Hovers

Probably the oldest method of electric brooding is the hover. Recently some redesigned units, patterned after suggestions made

by many poultrymen, have made this method even more suitable to chick brooding, especially for flocks over 500.

Electric hovers have all of the advantages of electric brooding in general as listed plus:

- Even heat distribution with no hot areas
- Temperature control easily accessible and simple to adjust. Thermostat is usually located on hover itself
- Factory-built units, complete in themselves, ready for immediate operation
- Rugged, well-braced units which withstand rough handling and repeated storage
- Low depreciation and little cost of maintenance

The average sized electric hover brooder handles from 500 to 750 chicks. It is equipped with a 1200 to 1500-watt heating element, fully protected for safety. Some units use a small light under the hover to attract the chicks.

Underheat or Radiant Floor

This is a relatively new method developed within the past five or six years. It has now become quite widely used, especially by big broiler growers.

Underheat brooders are either portable or fixed in place. The portable units make a "sandwich" of hardboard with heating cable in sand between them to provide the heat. The fixed-in-place units are usually made by embedding the heating cable in concrete slabs on the floor.

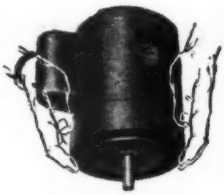
Performance tests have shown this method to be the most economical as far as cost of operation is concerned. Cost of material for installation is not excessively high but considerable labor is required to build the units and get them ready for operation the first time. Recently, some prefabricated portable type units have become available on the market in certain areas.

Users have reported the following advantages:

- Dry brooder house since heat from below tends to dry litter and droppings
- Cold room brooding possible with advantages listed above
- Easy cleaning since heat dries wet droppings
- More hover space for each chick (from .08 to .10 sq. ft. each) than any other type brooder now on the market
- Practically no maintenance cost after initial installation
- Warm concrete or sand holds heat for several hours in event of power outage

Insulation of some type is usually used below the heating cable for utmost efficiency. Generally, between 20 and 25 watts of heat are supplied per square foot. Heat is always controlled by a thermostat.

Hovers, about 12 inches high, are used over the slab and curtains are hung to conserve heat. Many users like to use a 7½-watt bulb under each hover as an attraction light. □ □



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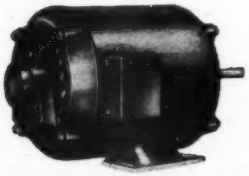

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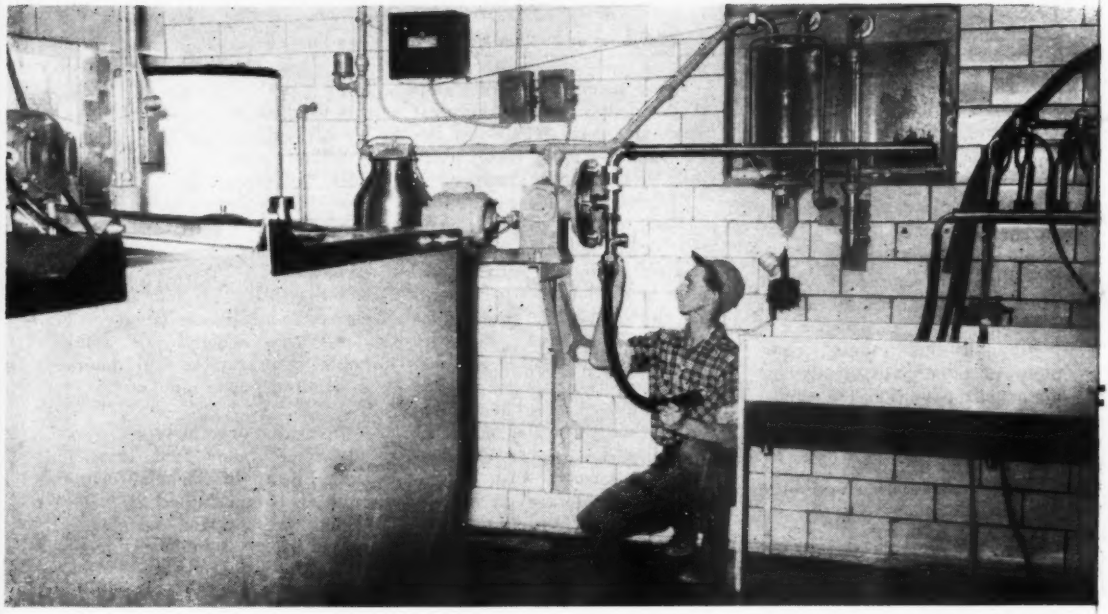


Cleaning pipeline milkers uses the bulk of hot water. Sam Noce of Danby, Mo., uses an automatic washing system to clean the pipelines faster and more thoroughly than is possible by hand. He says the 82-gallon water heater in background supplies plenty of 150°F water for his operation of 90 Holstein milkers. He also offers a good hint: "Use a trigger nozzle for spraying the milking room floor and save about 25% in hot water consumption for this operation."

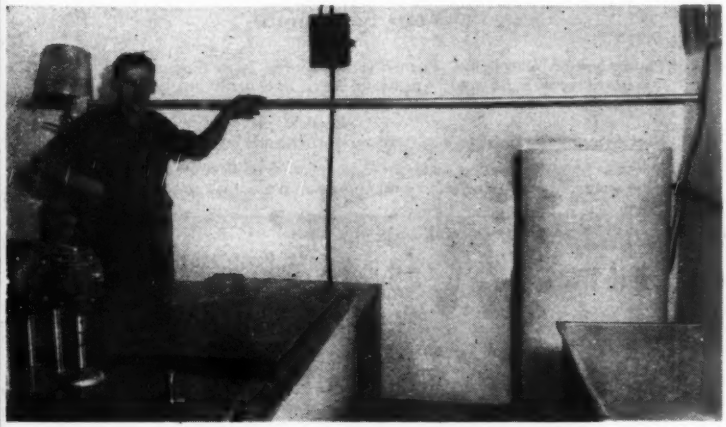
Let's look at

Milkhouse Water Heating

Dairymen need plenty of hot water for important chore jobs

By HUGH J. HANSEN

Improving milk quality, increasing production and meeting sanitation regulations have created an ever-growing need for adequate hot water. The days when a bucket of hot water would do are no more. Joe Spotts of Bellefonte, Pa., installed a 52-gal. heater to handle his needs.



Electric water heaters in milkhouses have eliminated one of the most time-consuming jobs around the dairy farm. Dairymen from all corners of the country are praising the advantages of having lots of hot water available for milkhouse cleaning tasks.

Besides the convenience afforded by automatic electric water heaters, they like the cleanliness. There are no fumes or flames to worry about—no holes to cut for vents or chimneys—no fuel supplies to worry over.

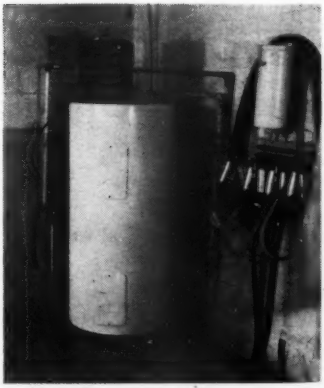
The trend in dairying toward larger herds and greater mechanization such as bulk coolers and pipeline milkers has increased hot water needs.

Missourians like to "be shown." Here, G. E. Elliot of Keokuk, Mo., is inspecting the new 40 gallon quick recovery heater his neighbor, Russell Eggers installed. Eggers has a herd of 25 Holsteins. He uses a 150 gallon bulk cooler and finds this heater provides ample water for his needs.

No specific heater sizes can be recommended that will completely satisfy every situation. However, a cross-sectional check reveals the following as general recommendations:

- **Up to 25 cows—50 gallon regular or 30 gallon quick recovery**
- **25-35 cows—66 gallon regular or 40-50 gallon quick recovery**
- **36-50 cows—80 gallon regular or 40-50 gallon quick recovery**

It is strongly recommended that you contact your power supplier for more specific recommendations before installing a milkhouse water heater. By studying your particular operation, he will be able to determine more exactly just what your requirements will be. He will also be in position to inform you of any local regulations which may govern your installation. □ □



Wisconsite, Ed Backhaus of Fredonia converted to a 50-gal. electric unit. His old flame unit caused excessive condensation when unvented—sent too much heat "up-the-chimney" when vented.

"Washing and cleaning chores need lots of hot water," says H. W. Leise of Portersville, Pa. "My 80-gal. heater has never left me without enough hot water to finish these jobs."

RESEARCH NOTES

By J. P. SCHAENZER

KANSAS STATE scientists have found that lime deposits can be removed from a steam iron by filling the water reservoir with distilled vinegar, letting it steam for 15 minutes, and then let stand over night.

A good man can milk and feed silage, hay, and grain to 100 cows daily in less than eight hours according to Dr. W. E. Petersen, dairy specialist, Univ. of Minn.

One irrigation three weeks before harvest increased the size and yields of peaches by 40 percent in experiments conducted by Maryland University horticulturists.

Easter lily bulbs must be held at 45° to 50° just before planting to bloom early. Keeping them at 32° F. will delay flowering say floriculturists at Beltsville Research Center, Md.

Tripling the wall insulation and installing positive ventilation in an otherwise wet section of a Michigan State University poultry house eliminated wall condensation and improved the litter condition markedly.

A machine to shorten honey extraction by whirling the uncapped combs through a cycle of four different speeds was developed by USDA researchers at Wisconsin Agricultural Experiment Station.

North Dakota agronomists have found that for 50 years of trials, average yields for spring plowing have been one bushel per acre more of wheat, 2.1 bushels more oats, and 1.3 bushels per acre more for barley than for fall plowing.

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Sprinkled Peaches Grow Big

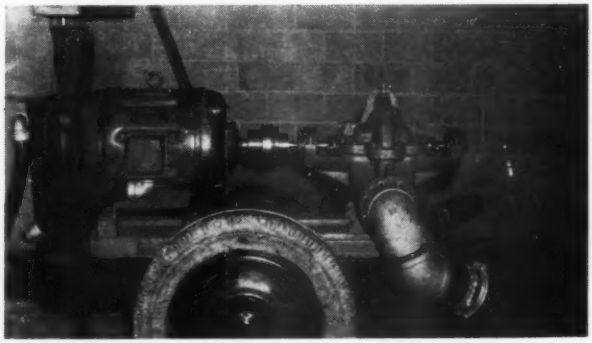
By A. W. COOK

Last summer the Crumpacker Brothers of Roanoke, Virginia decided to take decisive steps to insure themselves of a better fruit crop. Their operation is a sizeable one with 150 acres of apples and 200 acres of peaches.

In July they installed a new electric irrigation pump and sprinkler system to take care of a 60-acre patch of peaches. Crumpacker says, "The new pump practically paid for itself just by increasing the size of our peaches from one to one and one-half inches in diameter."

Water is pumped as far as a mile from the pump to the furthest nozzle in the peach orchard by a 60 hp, three phase motor. The water is taken from a pond through a six-inch line one hundred feet in length.

Crumpackers are so impressed with the value of irrigating their orchards that they have now decided to install another unit this season. The new unit, a 75 hp, three phase unit, will be permanently mounted at one of their larger ponds. □ □



Pump, motor, starter switches and plug-in cables are permanently mounted on a steel trailer for easy moving to any pond location.

Automatic Controls . . .

THE BRAINS OF YOUR ELECTRICAL EQUIPMENT

By G. W. ISAACS*

Any machine to be useful must be controllable. One very good reason why electrical equipment is so useful is that it can be so easily controlled and made automatic. Electrical appliances are often made completely automatic with the aid of such electrical controls as thermostats, pressure switches, humidistats, time clocks, or limit switches.

The simplest electrical control device is the common hand-operated switch, used simply to make or break an electrical circuit serving an appliance. An *automatic electrical control* is simply "a switch with a brain." It senses changes in some condition such as temperature, humidity, or time and automatically opens or closes its switch contacts according to the setting.

*Dr. Isaacs is Associate Professor of Agricultural Engineering at Purdue University.

Thermostats

Probably the most common type of automatic electrical control is the thermostat which controls by changes in temperature. They are built into almost all electrical heating and cooling equipment from water heaters to air conditioners. Their use in heated air crop drying equipment is indispensable to the economy and safety of such equipment.

A thermostat, as does any automatic electrical control, consists of a sensing element, an actuating mechanism, and the switch

(More on page 30)

When you go BULK . . . go to the BEST . . .

CRAFT coolers invite comparison from construction to cooling . . .

One in a series of Ads

Upgrade your milk quality . . . increase your profit . . . make your job easier—with these CRAFT features:

☐ **FASTEST COOLING . . . AT LOWEST COST** . . . Lowest blend temperatures made possible by exclusive design milk tank and patented **"Jet-Flow"** of ice water—entire surface continuously refrigerated.

☐ **BUILT TO LAST FOR GENERATIONS** . . . Heaviest of all frame of 3 inch "Ship and Car Channel" . . . legs that will hold up 20,000 pounds . . . 18-8 stainless steel throughout.

☐ **EASIEST OF ALL TO CLEAN . . . TO FILL** . . . Large cover openings and 3" radius, or 6" diameter, corners permit thorough cleaning of milk tank in record time . . . fast cooling minimizes bacteria development. Low height for easy, effortless pouring.

☐ **EXCLUSIVE 10 YEAR DIRECT FACTORY GUARANTEE** . . . Nothing to rust or deteriorate. Minimum maintenance throughout the years.

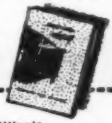
☐ **ABSOLUTE MAINTENANCE OF CALIBRATION** . . . Insures payment for all milk produced. Rugged frame can't sag under load. Milk tank can't flex or bulge. Permanent, accurate milk measurement.

☐ **EASE OF SERVICING** . . . All controls readily accessible through inspection cover.

☐ **EMERGENCY COOLING** . . . In case of power failure, ice bank keeps milk cool for 24 hours. If longer protection necessary, water tank can be filled with chipped ice.

☐ **WILL NOT FREEZE MILK** . . . Circulating 33 degree ice water cools quickly but cannot freeze—thus protecting milk quality.

New illustrated booklet gives valuable tips on remodeling your present milk house for bulk milk cooling.



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☐ Send me your FREE booklet, "Tips on Remodeling your Milk House for Bulk Milk Cooling", also information on Craft Coolers.

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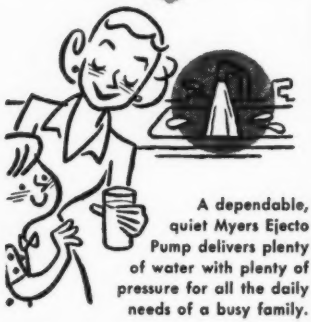
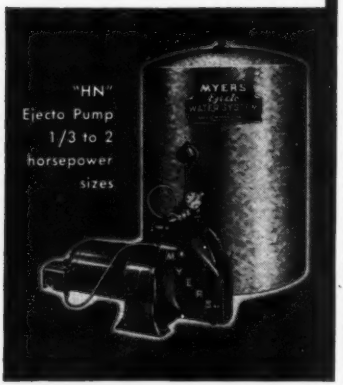
Myers Full Faucet Force
is a full-time helper



A dependable, quiet Myers Ejecto Pump delivers plenty of water with plenty of pressure for all the daily needs of a busy family.



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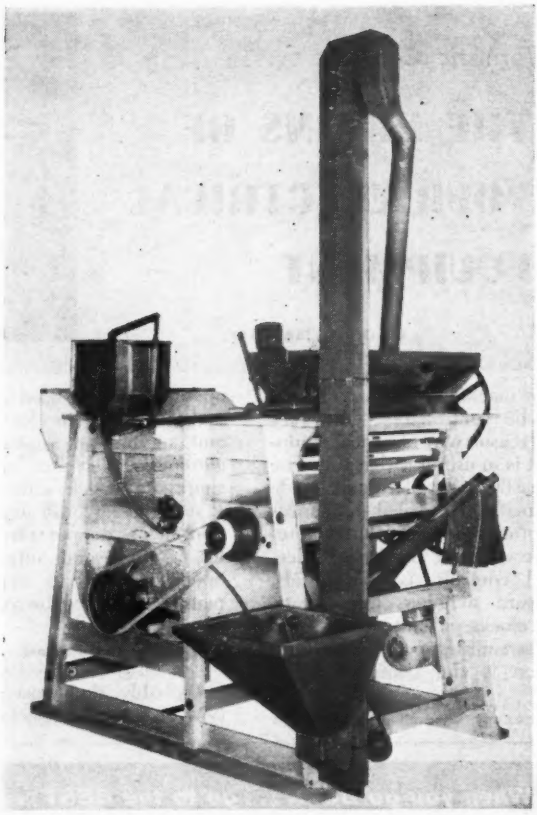


Cleaning-treating unit, equipped with conveyor and auger, will handle up to 125 bu. of seed per hour with 1 hp motor. Piston type chemical dispenser on left is adjustable to any desired flow rate.

It will pay to

Clean and Treat Seed on the Farm

Planting time means seed cleaning time. And hand-in-hand with seed cleaning is seed treating. For many, these operations also mean a lot of grain handling and shoveling.

There are now available on the market seed cleaners that will do both of these jobs in one operation. In addition, some of the units are equipped with augers and conveyors to move all of the grain into and away from the machine without its being touched by a shovel.

How the Cleaning is Done

Usually, a combination of screens and air blasts are used to remove foreign materials from the seed. The screens remove the oversize and undersize kernels and most foreign materials of sizes different than the desired seeds. Then a fan blast is

used to remove dust and light, unwanted materials.

Finally, an air blast is used to actually weigh each seed. The shrunken, inferior seeds are thus eliminated, assuring a higher percentage of plump, healthy seeds and better germination.

How the Treating is Done

Practically all seeds used today are treated with some chemical before planting. Chemical suppliers make treating agents of various types and consistencies to do certain jobs. But to do these jobs effectively, they must reach each individual kernel of seed.

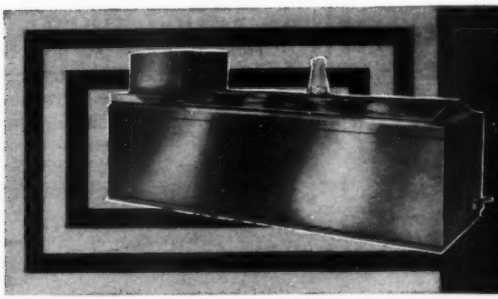
Most seed cleaner manufacturers now equip their units with a chemical treater mechanism. It will dispense diluted liquids or powder-water mixtures evenly and thoroughly throughout the batch of seed. It permits the operator to apply the correct amount of treating agent exactly as prescribed. Usually an auger is used to carry the cleaned seed from the machine and this completes the thorough mixing job.

How the Shovel is Eliminated

Augers and conveyors, either as part of the seed cleaner unit or as separate units, do this job. Many seed cleaners or fanning mills come equipped with a hopper and an elevator to feed the grain into the machine. Then an auger is used to remove the cleaned, treated seed from the machine. This may be just a bagging unit or it may carry the grain away to a truck, wagon, or storage bin.

Seed cleaners are available in most any size to fit the situation. A unit capable of handling 100 to 125 bushels of grain per hour is generally the best choice for the average farm. Larger units capable of handling several thousand bushels per hour are available for operations requiring such capacities. □ □

Water warmer boosts winter egg production according to poultryman Marvin Meyer of St. Charles, Missouri. He finds that supplying his layers with plenty of water at about 55° F maintains egg production during the winter when egg prices are highest—thus giving him the best possible profit. His automatic waterer has a 250 watt thermostatically controlled heating element. He also uses heating tape around the supply pipe to keep it from freezing. E. J. GILDEHAUS



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COOLS MILK PROPERLY UNDER ALL CONDITIONS

. . . with Exclusive Semi-Direct Expansion Bulk Milk Cooling

Only Haverly's exclusive cooling principle assures fast cooling without freezing and safe, proper cooling without mechanical refrigeration in emergencies. Haverly's copper heat exchangers draw heat from milk 24 hours a day and give continuous cream line cooling. Milk temperatures always go down — never up between milkings. Low blend temperatures and slow, natural agitation protect milk quality and quantity — guards milk flavor. Haverly saves money, too. Low operating cost. No special wiring required.

Haverly Bulk Milk Coolers are backed by 90 years of John Wood quality manufacturing experience.

Mail coupon today. Let us show you how to earn hundreds of extra dollars a year.

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Please send me full information on Haverly Semi-Direct Expansion Bulk Milk Coolers.

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NEW FILM giving inside facts on bulk milk cooling now available for showings — write for details.

Electric incubator (left) and hatcher are completely automatic. The 380-watt incubator has an electric motor and time control which automatically turns the eggs every hour. Eggs are transferred to 280-watt electric hatcher for last few days.

Electric brooders, three hover and one infrared, keep chicks warm. Newly hatched pheasants are small and quite delicate, requiring more heat than chicks. Trenis starts his pheasants at a brooder temperature of 98° and gradually decreases it.

Raising Ringnecks for Fun and Profit

Do you prefer your ringneck pheasant "under glass" on the dinner table or "on the rise" in a pheasant hunt? Either way, you can be assured of "getting the bird" if you practice some of the methods used on Dr. John W. Trenis' pheasant farm near Catlett, Virginia.

Because of the pleasure derived from raising five birds to train his dogs several years ago, and because he believed that pheasants could be produced on a paying basis, Dr. Trenis started a pheasant enterprise.

Chick Raising Practices Used

The hatchery was set up in the basement of the Trenis home. It is an excellent place for storage of eggs prior to incubation since it is cool and moist. Newly hatched pheasants are moved to a 14 by 30 foot cinderblock brooder house, equipped with four electric brooders. After three weeks in the brooder house the baby pheasants are allowed access to both brooders and outdoor runways. The older pheasants are kept entirely out of doors.

The pheasants are sold on several markets. Some are disposed of as brooding stock or for table use, but most of them are sold for stocking hunting clubs and game preserves.

Through smart management and the efficient use of good, automatically controlled electrical equipment, Dr. Trenis has developed a pheasant farm which today boasts nearly 3,000 birds.

ROBERT G. BASS

more water!

the Rapidayton

DOLPHIN* SUBMERSIBLE

a pump you can't see or hear
can't freeze • never needs oil
gives more water, more pressure

At last, a pump that gives you all the water you need, every place you need it—with much greater pressure. It's the Rapidayton Dolphin submersible. Goes into the well (to 500 feet), where it operates completely submersed. Easy to install. Fully automatic. Low cost—compares with deluxe jet system. Gives more water for your dollar. See it at your dealer's and write today for booklet, "What Kind of Water Pump Do You Need?"

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Established 1908 as Dayton Pump and Manufacturing Co.

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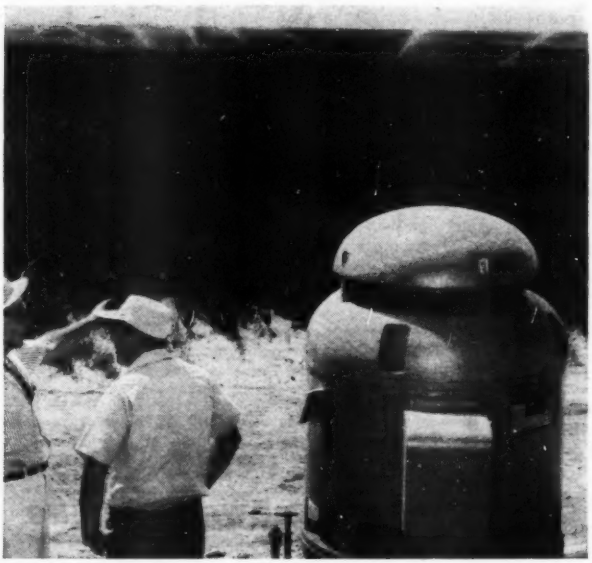
*TRADEMARK (PAT. PENDING ON DOLPHIN)

THIS IS A HEAT PUMP . . .

It is installed in the home of Mr. and Mrs. Reuben Dark. The Darks have been dairying in Alabama for the past eleven years. Several years ago they built a new home and, as Mrs. Dark says, "We were just a little skeptical about installing the heat pump. But our power supplier representative assured us that it would work, so we had it put in—and are we glad we did!" The Darks' home is a well-insulated brick veneer structure with a total main floor area of 2,400 sq. ft. Now the Darks enjoy all year air conditioning and heating from one piece of equipment. Even the full basement is air conditioned summer and winter by the 5-ton unit.

WALTER L. BAKER, JR.

"If our water stopped today, our farm would be worthless!" . . . Fred Kraft and Jimmie Icardo, Route 2, Bakersfield, Calif.



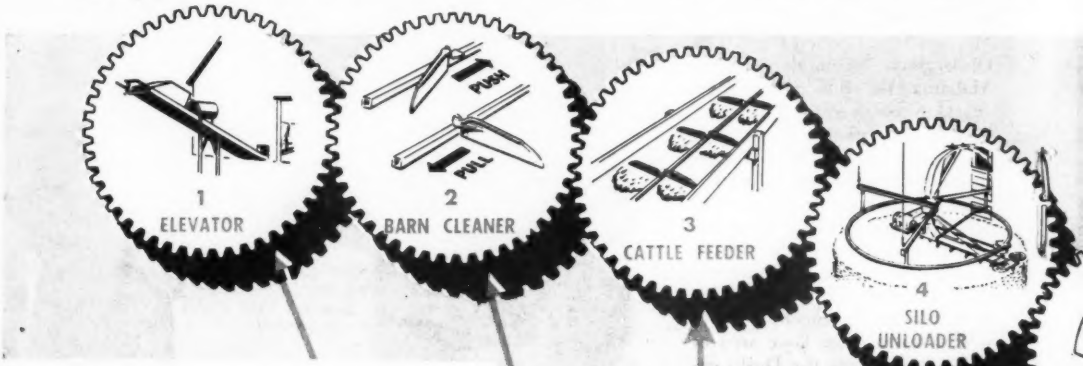
"Our Westinghouse-powered pump system makes our entire farm operation possible," say Fred Kraft and Jimmie Icardo, partners and operators of a 1000-acre ranch south of Bakersfield, California. "With our type of farming, you've got to put a given volume of water on your crop within a certain length of time . . . and you must have a dependable pump system.

"We run our motors and pumps 24 hours a day for months on end—the way they stand up is a real testimony to their ruggedness and dependability," says Mr. Kraft.

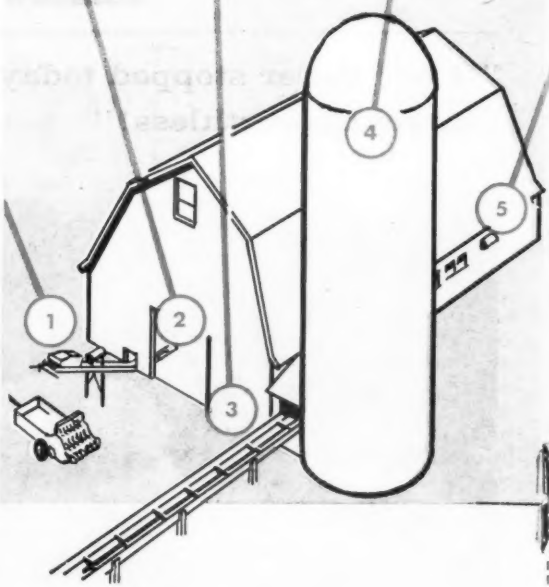
Ask your local pump dealer for a free copy of Bulletin 6737 covering the many advantages of Westinghouse pump motors. Or, write Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pa. J-22119

YOU CAN BE SURE...IF IT'S Westinghouse

Jamesway® POWER



1. **NEW — ONE MOTOR — DUAL DRIVE — HYDRAULIC CLEANER AND ELEVATOR.** One motor to buy, install, maintain. Elevator *always* runs 4 times faster than Shuttle-Stroke Cleaner.
2. **SHUTTLE-STROKE BARN CLEANER** — only 20% of your cost in the gutter. No chains, gears, sprockets. Mixes liquids and solids. Hydraulic power or mechanical drive.
3. **SHUTTLE-STROKE CATTLE FEEDER** — handles corn, grain, green chop . . . moves it in minutes to farthest end of bunk. Ideal feeding automation teamed with silo unloader.
4. **VOLUMATIC SILO UNLOADER** — skims off corn or grass silage — frozen or unfrozen — with level-cut action. Exclusive! — three-point suspension, power circle drive.
5. **POWER VENTILATION**— removes damp, germ-laden air automatically. Enclosed motor, sealed bearings. Complete size selection.
6. **DIRECT EXPANSION SANI-KOOL® MILK COOLER** — only 32″ high. 18-8 non-magnetic stainless steel. Remote or self-contained units. 160 to 500 gal. models.
7. **ICE BANK SANI-KOOL® MILK COOLER** — new "cool 'n' low" styling — 34″ high. Cools milk fast, economically! Holds the cold.
8. **MAGIC FLOW POULTRY FEEDER** — takes feed from bin to trough — no chains, belts, flights — just feed in the trough.
9. **V-TROUGH WATERERS** — 4-inch cover assures clean water — fresh every day. Float-controlled. Ideal for Power Choring Poultry House.
10. **SHUTTLE-STROKE PIT CLEANER** — moves droppings from pit to spreader at the push of a button. Just a few minutes a week does it.



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FOR POULTRY • FOR DAIRY • FOR LIVESTOCK

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Jamesway Power Choring is quick-way choring with an eye to economy. It mechanizes your most time-consuming jobs . . . takes the heart-straining work off your back . . . widens your profit opportunities. Look over the array of modern Power Choring equipment, made only by Jamesway. See why it offers today's most logical way to expand for greater profits.

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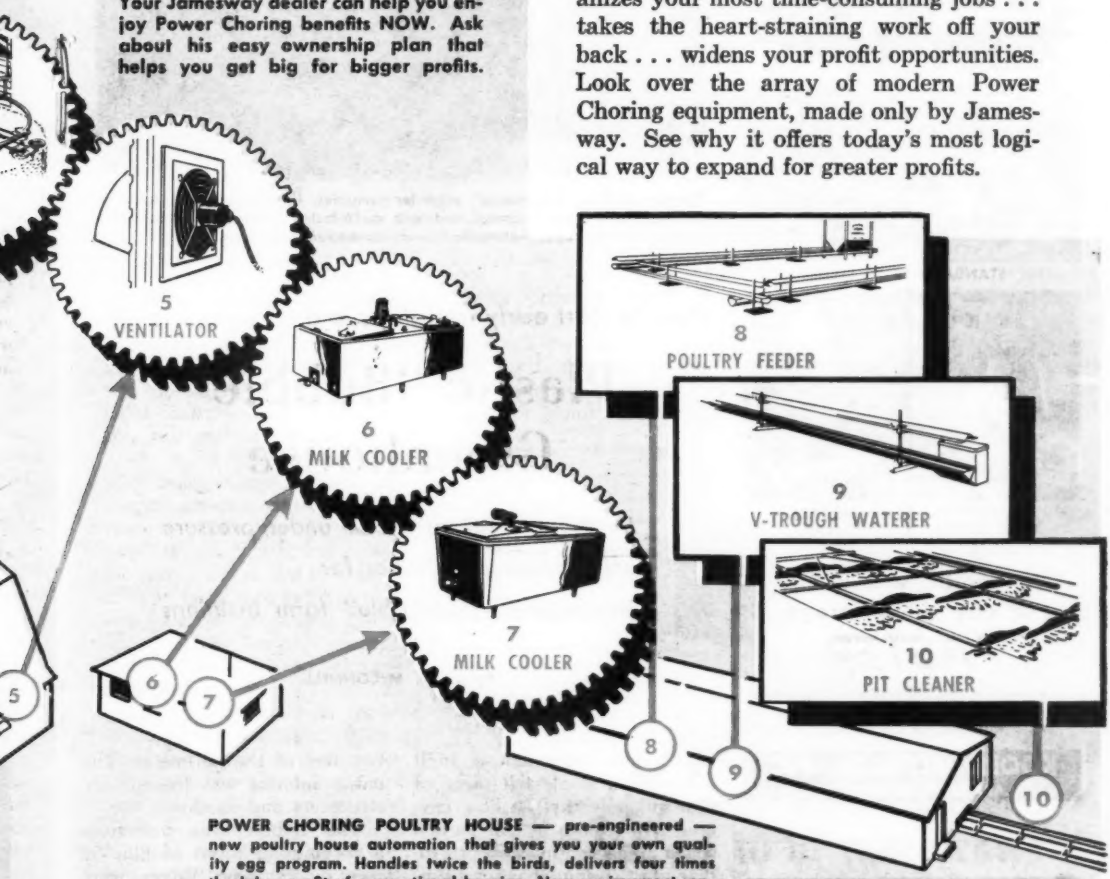
Your Jamesway dealer can help you enjoy Power Choring benefits NOW. Ask about his easy ownership plan that helps you get big for bigger profits.



POWER CHORING POULTRY HOUSE — pre-engineered — new poultry house automation that gives you your own quality egg program. Handles twice the birds, delivers four times the labor profit of conventional housing. New *environment control* does it—and each bird needs only 1½ feet of floor space.

FREE ...get complete information on the Power Choring Jamesway that teams your good management with electricity to save countless hours a year. Mail the coupon today.

Address: James Mfg. Co., Dept. EF-38, c/o your nearest division office. Ft. Atkinson, Wis., Lancaster, Pa., Los Angles 63, Calif.

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- ☐ Hydraulic Barn Cleaner
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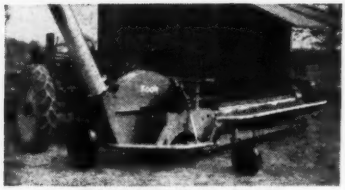
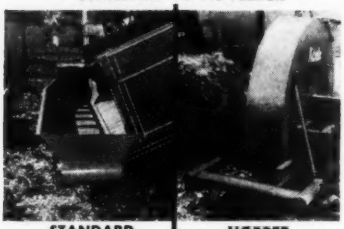
3 GREAT KOOLS FORAGE BLOWERS

challenge them all



STANDARD 10 FT. FEEDER



STANDARD WITH DROP SIDES | HOPPER TYPE

to handle wilted hay or any other forage

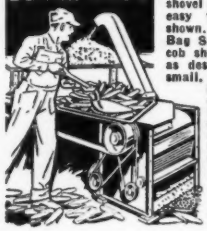
FASTER

. . . with less Horsepower per ton.
. . . with less Manpower.
. . . with less Set-Up Time.

KOOLS BROTHERS, INC.
APPLETON, WISCONSIN

SHELL CORN THIS FAST EASY WAY

135 TO 180 BU. PER HOUR



You've never seen anything to beat BELL'S NEW LOW-COST BALL-BEARING SHELLER. Shells corn about as fast as you can shovel it into the low-built easy feeding hopper, as shown. Equipped with 2-Bag Sacker, wagon loader, cob shaker or cob elevator as desired. Feed large or small, hard or soft ears. Pays for itself in time and labor saved. Electric motor, gasoline engine or tractor power. Write today for illustrated Folder and dealer's name.

THE C. S. BELL CO.
Manufacturers
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HILLSBORO, OHIO

Plastic "bubble greenhouse" used for tomatoes. Inflation of the 18 ft. by 50 ft. structure was accomplished with a 16-inch, ½ hp squirrel cage fan running continuously. Automatic louvers controlled ventilation.

How to start early tomatoes in a

Plastic "Bubble" Greenhouse

Structures held up by air under pressure offer future possibilities for inexpensive "disposable" farm buildings

By L. W. McCONNELL

A "bubble" greenhouse, built with a single flat piece of four mil polyethylene film, covered 870 square feet of garden space on a farm in Northern Indiana last spring. Structural support was provided by a constant running fan maintaining a slight pressure on the inside. In spite of the apparent flimsy nature of this greenhouse, its ruggedness was demonstrated by withstanding 50 m.p.h. winds, and successfully supporting 10 inches of wet sticky snow.

The inflated greenhouse took the shape of a well rounded loaf of bread approximately nine feet high at the center and five feet high at all points within two feet of the perimeter. The entire interior was free of obstructions and shadows.

The "bubble" was made from a rectangular piece of film 32 feet by 60 feet. Edges were wrapped around poles and buried in a two foot deep trench for anchorage. The ends of the building were rounded on a 9-foot radius and pleats were folded into the plastic to form the curve.

Covered Hotbeds Start Seeds

Tomatoes were started in the greenhouse on March 20th. Seedlings were propagated for 30 days under another polyethy-

Tomatoes, at the rate of 35 ton per acre, were harvested from these plants which grew for the first 80 days under a plastic "bubble". Air movement in the greenhouse was sufficient for pollination.

lene film used to cover a four by five foot bed within the main enclosure. Supplementary heat for this "hover brooder" hotbed was provided with thermostatically controlled soil heating cable and incandescent lamps.

On April 20th the seedlings were transplanted to their permanent growing positions in five rows with 2 ft. by 4 ft. spacing. Supplementary heat was provided during this period by a single 25 watt lamp suspended at plant foliage level on each 2 x 4 ft. spacing. The lamps were controlled thermostatically through a system of relays. No direct attempt was made to heat the air in the house. Infrared radiation from the lamps at close range protected the plant leaf tissue and soil. No auxiliary heat was needed during sunny daylight hours. Heat stored in the soil had a major influence on nighttime heating requirements.

Controlled Ventilation Used

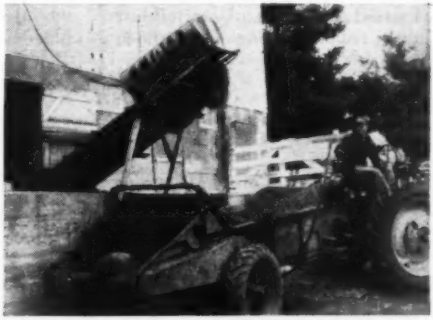
Ventilation was provided by merely controlling the rate of air escape from the structure. A louver operated by a thermostatically controlled furnace damper motor was mounted in a 14 by 18-inch window frame located at one end of the structure at ground level. When inside temperatures rose above 90°F, the louver opened automatically and permitted more air to enter.

Check meters were installed on April 20th to record the KWHr consumption for heating and for combined ventilation and inflation. A total of 461 KWHr were used between April 20th and June 8th (when the plastic was removed) for heating and 349 KWHr were used for inflation and ventilation. This averages out to less than 0.6 KWHr per month per square foot for the whole operation under the conditions described.

Design Loading Critical

Air supported structures as described here are relatively easy and inexpensive to build. However, design requirements are somewhat critical in regard to structural shape, inflation pressure, and loading on the anchorage of the structure. Unlike conventional buildings, load forces are upward instead of downward on the foundation. Properly designed, pneumatic buildings will withstand severe weather conditions. □ □

Planning to modernize your farm? Looking for ways to save chore time, enlarge your herd, and make your life easier by mechanizing your livestock operation? Write to Clay for free idea books to help you in planning mechanized barn cleaning, silo unloading and bunk feeding, milking parlors and crop driers.



New low-cost barn cleaner for herds of 10 or more cows

Here's a real back-saver. Just push a button and in minutes the CLAY *"Scotsman"* barn cleaner will remove a day's accumulation of manure.

Unload directly into the spreader, make the trip to the field and be back in far less time than you'd spend cleaning by hand. Use your working hours for easier, more pleasant chores.

Economical. The *Scotsman* quickly pays for itself in small or large herds. Here's a piece of equipment that you can use every day of the year.

It's built to last, by one of the world's oldest and largest manufacturers of barn cleaners. The Claymore Chain, featuring heat-treated forgings, offers 50% more bearing area, therefore, 50% more wear than most other barn cleaner chain. Close-spaced paddles are welded to the links so they can't loosen. Totally enclosed motor is safe from corrosion.

Free Planning Book gives facts, helps you decide whether it would pay *you* to install a barn cleaner. Tells difference between cleaners, and how to plan most efficient installation in old or new barns. Other valuable idea books available on silo unloaders, mechanical feeders, milking parlors, crop driers. For free copies, write to CLAY . . . *today.*

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Electricity in

THE FARM HOME

EDITED BY ELINOR C. WUEHRMANN

Kitchen Unity, Beauty and Efficiency Keynote

MAJOR APPLIANCES FOR 1958

Never before in history has there been as much emphasis placed on the kitchen as a complete unit as there is this year. Individual major appliances are no longer thought of as isolated units, but are designed to blend and flow into the overall decor of a modern kitchen.

Nearly every manufacturer of major electrical appliances has carried out the trend, started last year, of obtaining a "built-in look" in free-standing appliances. The squared-up, slimmer lines of 1958 appliances conform perfectly with the dimensions of standard cabinets and counters.

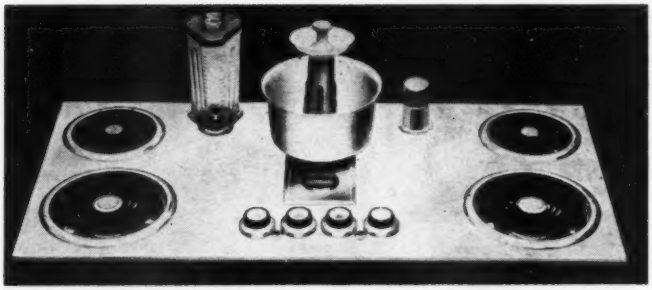
Naturally, built-in appliances are emphasized in any remodeling or new kitchen plan. But many of the same desirable features of built-in appliances can also be obtained by the person who is buying a free-standing replacement appliance.

The era of the small "efficiency" kitchen is over. Architects, builders and manufacturers now realize that people want the kitchen for a family room. They want space to eat, to entertain, for recreation—right in the kitchen. Homemakers like the idea of a kitchen large enough to include laundry equipment, sewing and business centers and a safe area for the children to play under Mother's watchful eye.

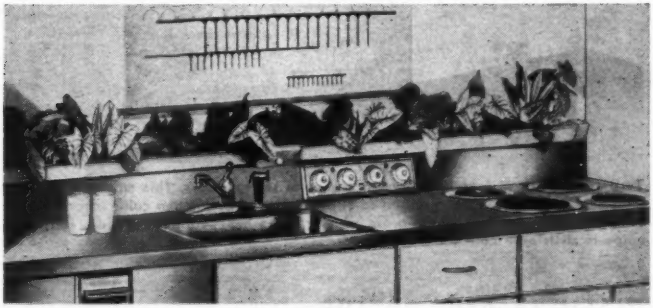
RANGES...

Push button simplicity is a feature on many of the new ranges. Three surface units are controlled by the buttons. The fourth is usually a more flexible, infinite control or thermostatically controlled unit for cooking jobs, such as frying, that require more exacting temperatures. Automatic clock controls have also been simplified on many new models. All features on the new ranges are designed for easy cleaning.

Trim lines of 1958 electric ranges allows them to be placed in a row of cabinets, flush to the wall. A built-in look is thus obtained. This new model features improved broiler design. The special broiler pan prevents spattering on the oven walls and eliminates nearly all smoking—cleanup is easier. Special control for broiler allows owner to dial for "rare", "medium" or "well done."

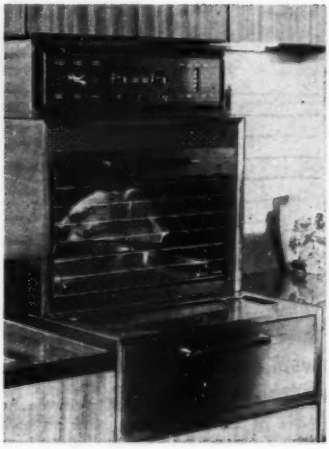


Food preparation center in the true sense is this combination built-in food center and range top. One under-counter motor powers the combination mixer, blender, meat grinder and knife sharpener. The divided suface unit is flush mounted to drop into any counter top without loss of drawer space.



Combination sink and range tops are being manufactured by several companies. These stainless steel units may be placed on top of standard cabinets for that truly modern, all-electric kitchen look.

Such a kitchen is naturally the center of family activity. As such it has to be efficient and attractive. Major electrical appliances for 1958 have never been more efficient or more attractive. In design, in treatment of color and trim, and in added or improved features they are sure to accomplish their goal of beautifying any kitchen and in making it a more effortless and pleasant place in which to work and for the family to gather.



New products include, right: split level meat and pastry oven. Top oven is right size for meat cookery. Below is drawer-type pastry oven. It will hold four 8-inch cake pans or your highest angel food pan. Above: New feature on one model is a "thawer oven." Unit fits over the automatic surface unit, assuring fast thawing or baking of frozen foods.

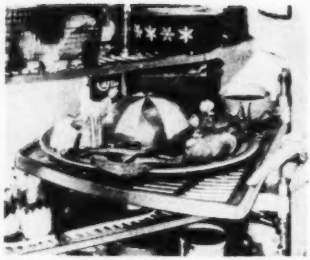
REFRIGERATORS...

Refrigerator-freezer combinations, with a large freezer section on the bottom are becoming more popular, as evidenced by the great number of models on the market this year. Many of them, such as this one, are vented from the front so that they may be built-in. Nearly every large refrigerator now being produced has new square styling. Several of them have had redesigned doors so that they need no clearance for door opening.

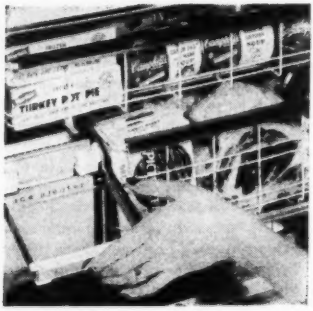
Look what's happening to the refrigerator! Several manufacturers are now producing refrigerator-freezer combinations in which the freezer section is larger than the refrigerator section. This model features an 8.3 cu. ft. refrigerator, above, and a 10 cu. ft. freezer, below.

(More on page 24)

Major Appliances *Continued from page 23*



We're all familiar with refrigerator shelves that spin around or glide out. This year sees another type—they swing out. At a touch, shelves will swing out to bring food within easy reach. A jack-type device on the shelves permits them to be raised or lowered while fully loaded.

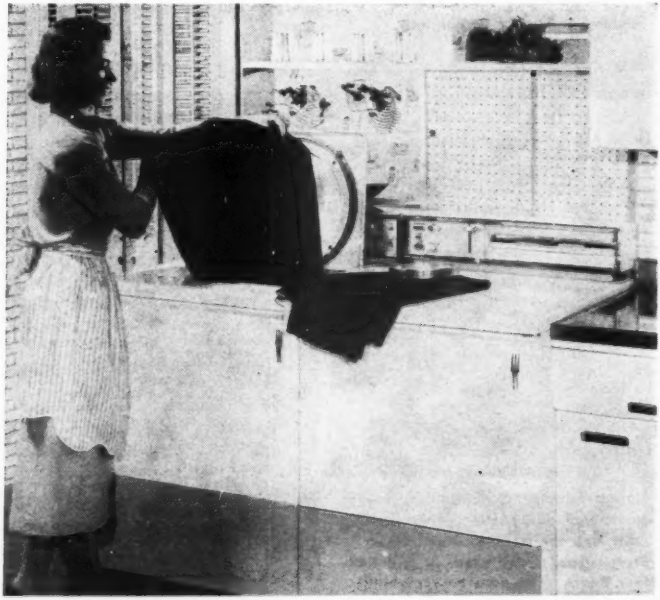


Ice ejectors and ice makers are convenience features found in a number of 1958 refrigerators. They include a device to automatically release ice cubes and an attractive bin for storing and serving the cubes.

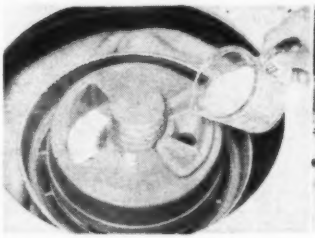
Freezers, too, have been glamorized this year. They are more compact, yet hold great quantities of frozen foods. This model has new square-corner styling. It measures only 31 inches wide and 63 inches high, yet holds nearly 500 pounds of frozen foods.

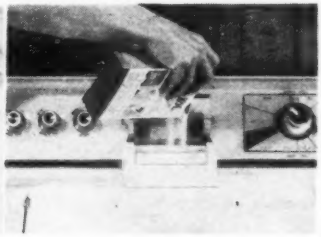
Two-tone look is found on several makes of refrigerators. This model is equipped with a panel that can be changed to suit your mood or kitchen color scheme. Eleven different textured and wood grain vinyl panels are available. Inside, a tiny fan helps to distribute cold air more evenly.

WASHERS AND DRYERS



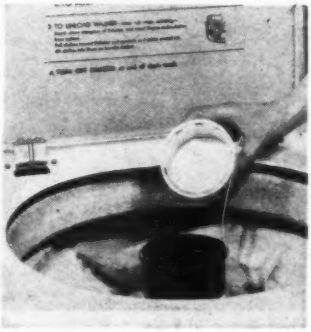
Wash and wear clothing gets special treatment in many of the new washers and dryers. Water temperature, both for washing and rinsing, can be pre-set for the particular fabric. Speed of agitation, too, can be regulated for synthetic fabrics. Many of the new dryers have an automatic cooling-off period in which clothes tumble without heat for the last few minutes.

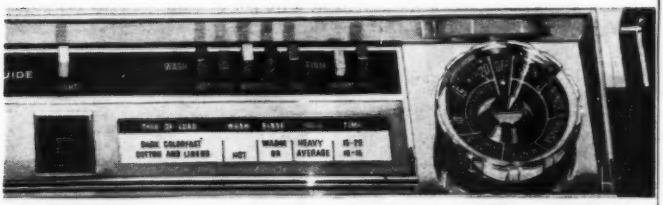




WATER PLUS—

Whatever you want to add to it for better laundry results is now a completely automatic operation. A great variety of mechanical devices, such as these, are found on the new washers. They will add detergents, blueing, tinting materials, bleaches and water or fabric softeners at the right time in the cycle. Filters to remove lint are also found on many models. No doubt about it, automatic washers are now truly automatic!

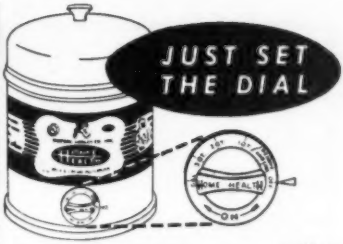




Laundering may sound complicated in this age of synthetic fabrics and chemical additives to condition water or clothes. But manufacturers have done all they can to simplify your job. Dials and push buttons tell you what settings are needed for the type of wash you are doing. Several makes, like this one, have complete instructions right on the control panel.

(Continued on page 26)

Combination washer-dryers continue to increase in popularity. They include many of the same features found in separate units, plus the added feature of taking less floor space. They can be installed in the kitchen, bathroom or even a closet. The main thing is that the space-saving combination gets the laundry area up out of the basement to a more convenient location.



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Now you can pasteurize the amount of milk you need as you need it . . . one, two, three quarts or a gallon at a time. Just set the dial for the right amount . . . the rest is automatic. The only home pasteurizer with this new engineering development that takes far less time yet assures greater accuracy. Laboratory tested for complete kill of all harmful bacteria.

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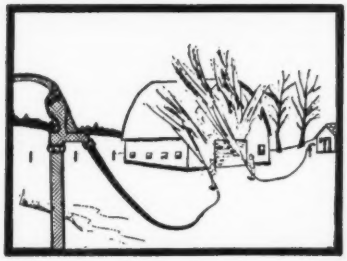

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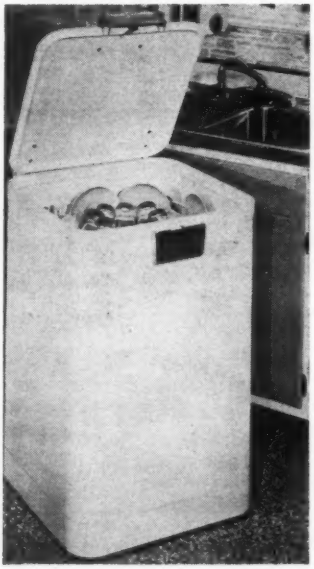
OSHKOSH FILTER & SOFTENER CO.
Oshkosh, Wisconsin

Major Appliances *Continued from page 25*

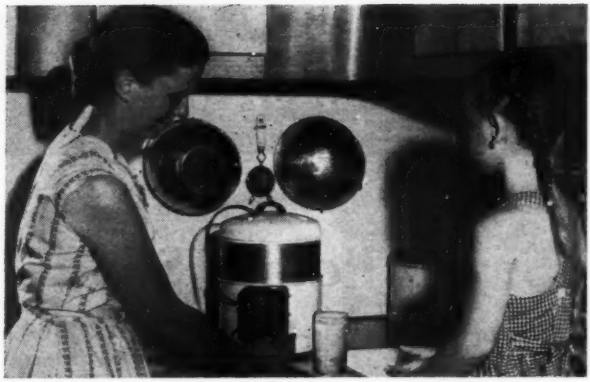
DISHWASHERS

New idea in placement of dishwashers is seen in this model kitchen. The dishwasher is raised to the same height as a built-in oven. Really makes a lot of sense. Two revolving rotors, one below each rack, drive jets of extra hot water thoroughly over all dish surfaces in this 1958 model.

Changeable front panels are a feature on several new under-counter dishwashers. The panel can be easily changed to any pattern, color or wood finish in laminated plastics, or metal panels to meet kitchen planning and decorating needs. These panels are durable and easy to care for.



Portable dishwashers are as popular as ever. This model will hold a complete service for eight. It is a neat, compact unit and is low enough to be stored under most kitchen work counters. Portables are very convenient for people who have to move frequently because they can take them along.



Living in a trailer in the middle of the desert may sound like "roughing it", but the Bakers' luxurious mobile home has every modern convenience. One of them is an automatic home milk pasteurizer that assures them of safe, pure milk.

Mrs. Baker says . . . .

"I Wouldn't Think of Letting My Children Drink Raw Milk....."

Yes, I use a home pasteurizer," said Mrs. Baker on the phone, "but next week we're moving from Phoenix to forty acres in Avondale, Arizona, where we will live in a trailer until our new ranch is built. We have five children, Tom, 9, Louis, 8, Jim, 6, Jean, 5, and Johnny, 2. Come to see us next week and I'll show you how important our pasteurizer is."

I did call on Mrs. Baker a week later and this is what I learned.

"My husband bought a Guernsey cow with a calf," she began, "and we're planning to raise the calf. He paid $200 for them. The next thing we purchased was a pasteurizer.

"We figure the very lowest the calf would be worth would be $100," Mrs. Baker continued, "when we add about $5.00 per month for feed for the cow, our investment will amortize itself in about 6 or 7 months. Then our milk shouldn't cost more than 5 cents per gallon.

"Now let me tell you about the pasteurizer. It's handy and so simple to use. Tommie, or my husband, does the milking, and I pasteurize a gallon to a gallon and a half at a time.

"The pasteurizer uses 660 watts, and it takes only about 10 minutes for a gallon to come to the proper pasteurizing temperature. This temperature is maintained thermostatically so there is no danger of "cooking" the milk. The minute the buzzer on the pasteurizer rings I remove the covered container and cool the milk immediately.

"Even though we may be living in the desert, my family isn't going to be without any of the essentials. We think they're going to have an opportunity to learn many things they wouldn't be able to learn in the city."

RUTH D. KRUGER

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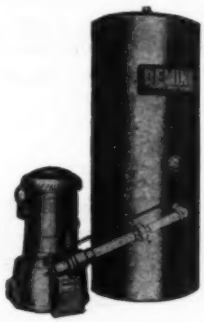

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Sweet Potato Slips for a Ready Market

Two years ago Robert Horn, assistant county agent in Chambers County, Alabama, became interested in the local market for sweet potato slips. There were a few hotbeds scattered over the area but most of the slips used locally each year had to be imported.

Horn went to work on the problem in cooperation with the local 4-H program. Eleven 4-H members responded. Each set up his own small hotbed to take advantage of the local market, to learn more about farming—and electricity—and to earn a little extra spending money.

Typical of these young enterprisers is Wayne Cole, LaFayette High School 4-H member shown here. Wayne's hotbed measured 6 ft. by 16 ft., a little larger than the average of the 11 installed. Eight bushels of certified Gold Rush yams were planted in sawdust heated by 800 watts of thermostatically controlled electric heating cable.

Four weeks later, just in time for the opening market, he pulled some 4,000 strong, healthy, mature sweet potato slips. In subsequent weeks, he pulled about 20,000 more, enough to pay for the beds with some "spending money" for his labor. Wayne and the ten other 4-Hers in the county had gained in more than one way from their experience.

Walter L. Baker, Jr.

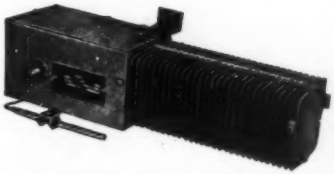
Eight bushels of yams, planted in electrically-heated sawdust, produced 24,000 mature potato slips. 4-H'er, Wayne Cole, made a nice profit on this project.

Isn't it AMAZING how many wives can accomplish a fur coat by practicing SIGHCHOLOGY on their husbands. . . . . While we're on the same general subject, the fellow who CLAIMS he understands women is EITHER a PSYCHOLOGIST or in NEED of one. . . . . SODDEN THOUGHT: You can't ALWAYS judge a man by the company he keeps—it MAY be his wife's relatives. . . . . TRY-THIS-FORMULA: IF you want to flatter somebody, just LOOK serious and ask him what he thinks of the general situation. . . . . A henpecked lil fellow we know puts it this way, "EVER since I said 'I DO,' there's been a heckuva lot of things I DON'T." . . . . . FLIP QUIP: MANNERS are a difficult symphony in B NATURAL. . . . . OVERHEARD: "I'm QUITE a sleuth. On my last big case, while looking for clues, WHERE do you suppose I found them? V-E-R-Y simple. I FOUND them in a CLUES CLOSET!". . . . . BACHELOR: a man who will get married IF he can find a girl who loves HIM as much as HE does. . . . . "MORE of TV's broadening influence comes from the SIT than the SET." (S. Omar Barker in QUOTE). . . . . EVERSTOPTO-THINK?—If YOU were someone else, would YOU like to be YOUR friend? . . . . . Mrs. Newlywed (to her husband): "Darling, will you lend me forty dollars and give me only twenty of them? THEN you'll owe ME twenty and I'll owe YOU twenty, and we'll be EVEN!". . . . . THINKEROO DEPT.: A really good test of your blood pressure is to watch a man being liberal with the money he owes YOU. . . . . Zelda Malone sez: "TOO many girls seem to think the way to travel the road to success is to take to the HEIR." . . . . . REALITY: THAT'S when you leave dirty dishes in the sink, and they're THERE when you come home. . . . . From a college freshman's exam paper, "Joan of Arc was NOAH'S wife.". . . . . From the Illinois Wesleyan Argus, this LAST BLAST: Workers earn it, Spendthrifts burn it, Bankers lend it, Women spend it, Forgers fake it, Taxes take it, Thrifty save it, Misers crave it, Robbers seize it, Rich increase it, Gamblers lose it, I could use it. . . . .

Your pun-peddler—DUFFY

NATIONAL 4-H SHEEP SHEARING CHAMPION for 1957 is Chester F. Baker, 19, of Palmyra, Virginia. Chester won first prize from a field of 29 4-H'ers from 21 states competing for a college scholarship and savings bonds awarded by Sunbeam Corporation, sponsor of the contest. Speed, experienced technique and fine workmanship permitted Baker to run away with the contest. His best time was 3 minutes, 58 seconds, more than a minute faster than the second place winner. This champion netted a top score of 92.95 out of a possible 100 in the contest. Second place winner was Russell Johnson, 19, of Hillsboro, Ohio, with a time of 5 minutes, 26 seconds and a total score of 91.56. Billy Abbott, 21, of Lurny, Virginia, took third honors with a time of 5 minutes, 45 seconds and a total score of 91.33.

HEAT For Your
PUMP HOUSE



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EQUIPMENT MFG. CO.
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Do the job quick in farmer's own yard—no dismantling or hauling to town. New portable Foley Disc Sharpener (fits in car trunk) jacks up harrow, rotates discs as it sharpens them, in 1 or 2 minutes per blade. Saves farmers time, trouble, money—and you can make up to $25 a day.
FREE PLAN—shows how to start—no experience needed. Write today.
Dept. 3, C. M. FOLEY CO.
COLUMBIA HEIGHTS, MINNESOTA

Automatic Controls

(Here from page 13)

contacts. The sensing element on a thermostat senses the temperature to be controlled. The element commonly consists of a bimetallic strip or a liquid or vapor-filled bellows or spiral-shaped tube. Changes in temperature produce a movement of the sensing element which is amplified by the actuating mechanism and used to open or close the switch.

Some thermostats have the sensing element located remotely, (sometimes several feet) from the switch contacts. This feature often has decided advantages. For example, when controlling water temperatures, it allows the switch to be located away from the water.

Pressure Switches

Pressure switches provide the "automatic" in our automatic water systems by turning on the pump when the water pressure is reduced by water usage and turning off the pump when the pressure is restored. Pressure switches are also used on air compressors and some refrigerating compressors.

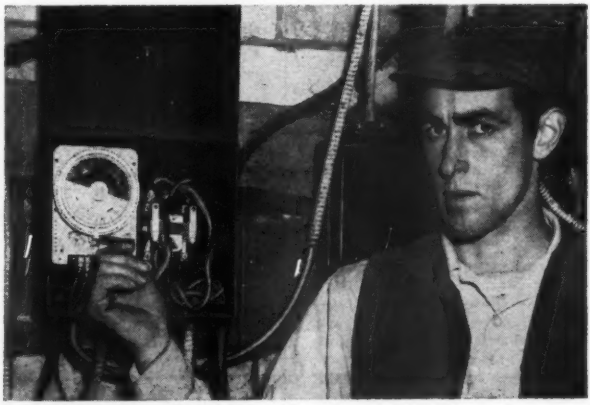
One automatic grain dryer uses a type of pressure switch to control the level of grain in the drying chamber. When the grain reaches the level of the pressure switch, the conveyor moving the grain is automatically stopped. This type of switch also finds many applications in feed handling systems.

Pressure switches are usually actuated by a pressure against a rubber diaphragm or metal bellows. The movement caused by a change in pressure is transmitted by the actuating mechanism to the switch contacts.

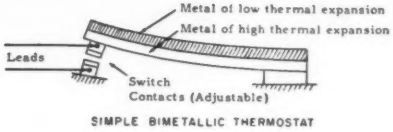
Two adjustments are usually provided on the pressure switch. One determines the operating range of the switch, usually the cut-out point or the point that the switch opens. Another adjustment, the differential adjustment, determines the differential between the cut-out and cut-in points. For example, in adjusting a water system pressure switch to cut out at 50 psi and to cut in at 20 psi, one would first set the range adjustment at 50 psi, then set the differential adjustment for a differential of 30 psi, or to cut in at 20 psi.

Time Switches

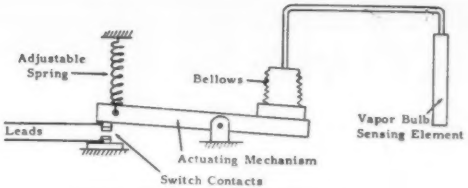
Time switches turn equipment off or on at a particular time. They are built into many types of electrical equipment such as ranges, ovens, milk pasteurizers, radios, and electric feed grinders. Time switches are available to control almost any equipment from lights to coffeemakers.



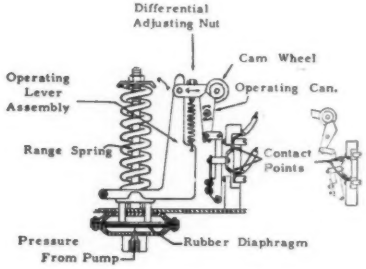
Time clock switches are the "brains" that make many operations "automatic." Their flexibility provides controlled operation at certain periods of the day, for certain lengths of time, or at predetermined increments of time.



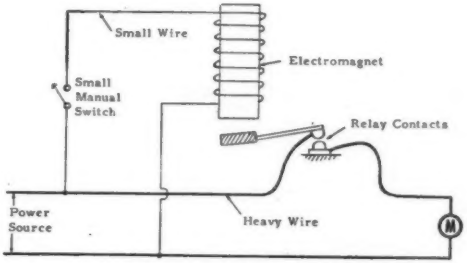
SIMPLE BIMETALLIC THERMOSTAT



REMOTE SENSING ELEMENT THERMOSTAT



PRESSURE SWITCH



SOLENOID OR RELAY SWITCH

A time switch consists simply of a clock mechanism, either electrical or mechanical, which furnishes the power to open or close switch contacts at a predetermined time.

Humidity Switches

Humidity switches operate according to the relative humidity of the atmosphere. They consist usually of a hair element that changes in length with changes in relative humidity. The movement caused by the change in length is amplified by the actuating mechanism and used to operate the switch contacts.

Humidity switches may be used to allow drying fans to operate only when the humidity is low enough for efficient drying. They are also used as an automatic control for basement dehumidifiers.

Electrical Relays or Solenoids

An electrical relay is a switch that is operated by the force of an electromagnet instead of by hand or by the force of a sensing element. Electricity passed through an electrical coil on the electromagnet produces the force to operate the switch. Another switch, either manual or an automatic control switch such as a thermostat controls the electric power to the electromagnet coil.

One might well wonder why use an electrical relay. Why not let the manual switch or auto-

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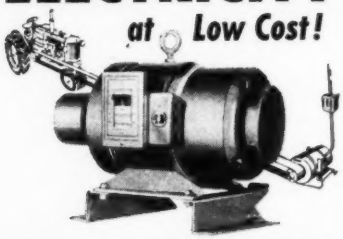

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SAVE TIME AND LABOR

matic control open or close the circuit to our machine directly? This can be done with small electrical loads; for example, a ¾ hp pump could be controlled directly by a pressure switch. However, a 3 hp motor operated in this manner would soon burn out the contacts of most pressure switches. Therefore, we let the pressure switch control the small electromagnet in our relay. The electromagnet in turn operates heavy switch contacts which can safely operate the motor. In this way, almost any inexpensive automatic control switch can operate machines of any size. The relay itself is selected to handle the particular machine.

Limit Switches

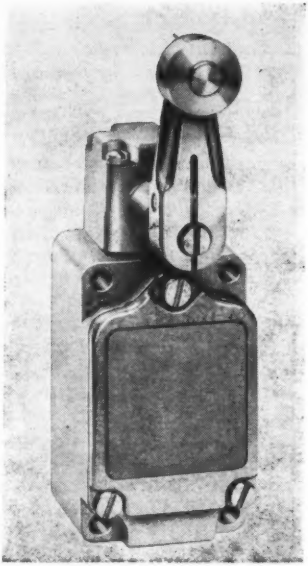
Limit switches are used to sense the movement of a particular mechanism and to shut off the power to the device that is causing the motion. The switch may be tripped by the carriage on a hay carrier system, a knot on a rope or cable, by a power-operated door, or in other similar situations. The switch that turns off the refrigerator light when the door closes is a limit switch.

Selecting Automatic Controls

In order to obtain the right control for a particular job, one needs to specify the following:

Variable to be controlled and range within which it is to be controlled. For example, in ordering a thermostat for an air conditioner one might specify a range of 50 degrees to 100 degrees.

Sensitivity or accuracy of control. All controls allow a certain small amount of fluctuation of the controlled variable. Usually, the more expensive the control, the less fluctuation or error it will allow. An error of two degrees might be the maximum tolerable in a fruit storage, but an error of four might be allowable with a milkhouse heating installation.



Limit switches such as this are used to automatically stop an operation when completed such as filling a feed hopper.

Arrangement of switch contacts. For controlling heating equipment the contacts are arranged to open on a rise in temperature. For cooling equipment, they should open on a drop in temperature.

Switch current and voltage rating. The switch contacts must be heavy enough to safely interrupt the power they are carrying. Both the current and voltage are important. Some switch contacts are given ratings for "non-inductive" loads. These include only heating and lighting loads which are easier on electrical contacts. If contacts so rated are used on electric motors, their capacity is reduced from 25 to 50 percent.

The measure of usefulness of your equipment is to a certain degree determined by how easily it can be controlled or how automatically the operation is performed. Why not make your applications as useful and profitable as possible by coupling some imagination and ideas with the appropriate controls discussed. □ □

In the April

ELECTRICITY ON THE FARM *Magazine*

LOOK FOR PRACTICAL ARTICLES ON

Bulk Milk Cooling

a round-up of the reasons why farmers prefer their particular bulk cooler and pipeline system

All Electric Farm

an Ohio farmer goes 100% electric and is delighted with the results

Poultry Farming Mechanization

University of California reports that mechanization can mean big, new profits for the poultry farmer

Is Your Well Contaminated?

a Spring check will tell—here's what to do about it

Hay Drying

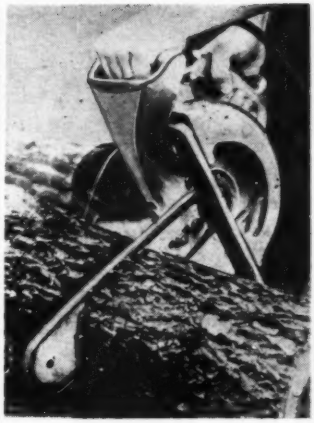
here's how to make ducts and select fans for electric drying systems

Questions and Answers on Dishwashers

answers to some of the most frequent questions of homemakers on electric dishwashers

Freezing Meals "In A Bag"

novel use of two food freezers provides a farm homemaker with complete, ready-cooked meals for family or company dinners



Convertible Saw

A new saw attachment is now available that converts a heavy duty portable saw into a handy chainsaw. The attachment fits onto the portable saw forming an integral unit for cutting timber, firewood, or other heavy cutting jobs.

The combination makes an easy-to-handle unit that is ideal for hard-to-get-at places such as overhead beams or joints, deep pocket cutting, notching and other jobs where a regular circular saw is limited in use. The attachment also has large claw teeth for positive gripping of the wood being cut. An aluminum shield protects hand and body from flying chips.

The unit will cut tree logs up to 18 inches in diameter. This type of saw is also very convenient for rapid cutting of stacked dressed lumber.

We will be happy to supply you with additional information regarding this new unit. Just send us a card requesting it. □ □

NEW streamlined **TANKMOBILE** portable air compressor saves time and work. Low slung design makes moving safe and easy. Heavy duty single cylinder compressor. Electric motor or gasoline engine. Two tank sizes available.

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ADVERTISERS

in this issue . . .

Whenever you need further information about electrical equipment and appliances, you can depend upon the Manufacturers who are advertising in this magazine. We have indexed here for your convenience in alphabetical order the Manufacturers whose advertising is appearing in this March issue.

When writing to these Manufacturers be sure to mention you saw their advertising in ELECTRICITY ON THE FARM Magazine.

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If you are unable to get information about the particular equipment you require from our advertisers as listed above, our Reader Service Department will be glad to help you. As a reader of this magazine you are entitled to this information service free of cost.

QUESTIONS AND ANSWERS

Bulbs for Kitchen Fixtures

▶**Question:** *Recently we purchased a new kitchen light fixture—one of those with a ceramic globe. Now we discover that it will take only a 100-watt bulb and we need more light in our kitchen. Are there special bulbs for such fixtures?*

E.B.S., Mass.

▶**Answer:** Yes, there is on the market a special 150-watt bulb which has the same physical dimensions as a regular 100-watt bulb. Its use in your new fixture will substantially increase the illumination of your kitchen.

Roof De-Icing

▶**Question:** *In your January issue article you state that heating cable for roof de-icing should be operated only when outdoor temperatures are above 30° F. Doesn't trouble occur at lower temperatures?*

C.N.T., N.Y.

▶**Answer:** You are correct. Actually, there is no problem of ice-dam formation when temperatures are above freezing. The ice-dam forms only when outside temperatures fall below freezing. Then, when the roof edges are well below freezing, heat leakage upward through the roof melts the snow. As water runs down and reaches the cold eave area, it freezes and the ice-dam builds up causing water to back up under shingles and inside the house.

It is during this period when outdoor temperatures range between 20° and 32° F. that the roof de-icers should be used.

Heat Resistant Lamps

▶**Question:** *I have noticed that some lamp bulbs are labeled "heat resistant". Others are made with "hard glass" and still others are "weather proof" or "moisture resistant". What is the difference among them?*

S.E.C., Ohio

▶**Answer:** Many terms such as those you have listed are used to describe bulbs made with Pyrex glass. This glass is especially designed to withstand thermal shock—in other words it will not readily break when a drop of water falls on the hot glass. This does not mean, however, that high wattage, hard glass lamps should be used out-of-doors without a protective shield of some sort. Lamps of 300-watt size and smaller should be OK outdoors provided they are not burned in a base-down position so rain and snow will strike the hot face of the lamp. The PAR type lamps are suitable for use outdoors without protection of a shield.

Kite Flying Rules

Never run across streets or highways while flying kites.

Never let a kite go over TV or radio aerials.

Never fly a kite near electric or trolley wires.

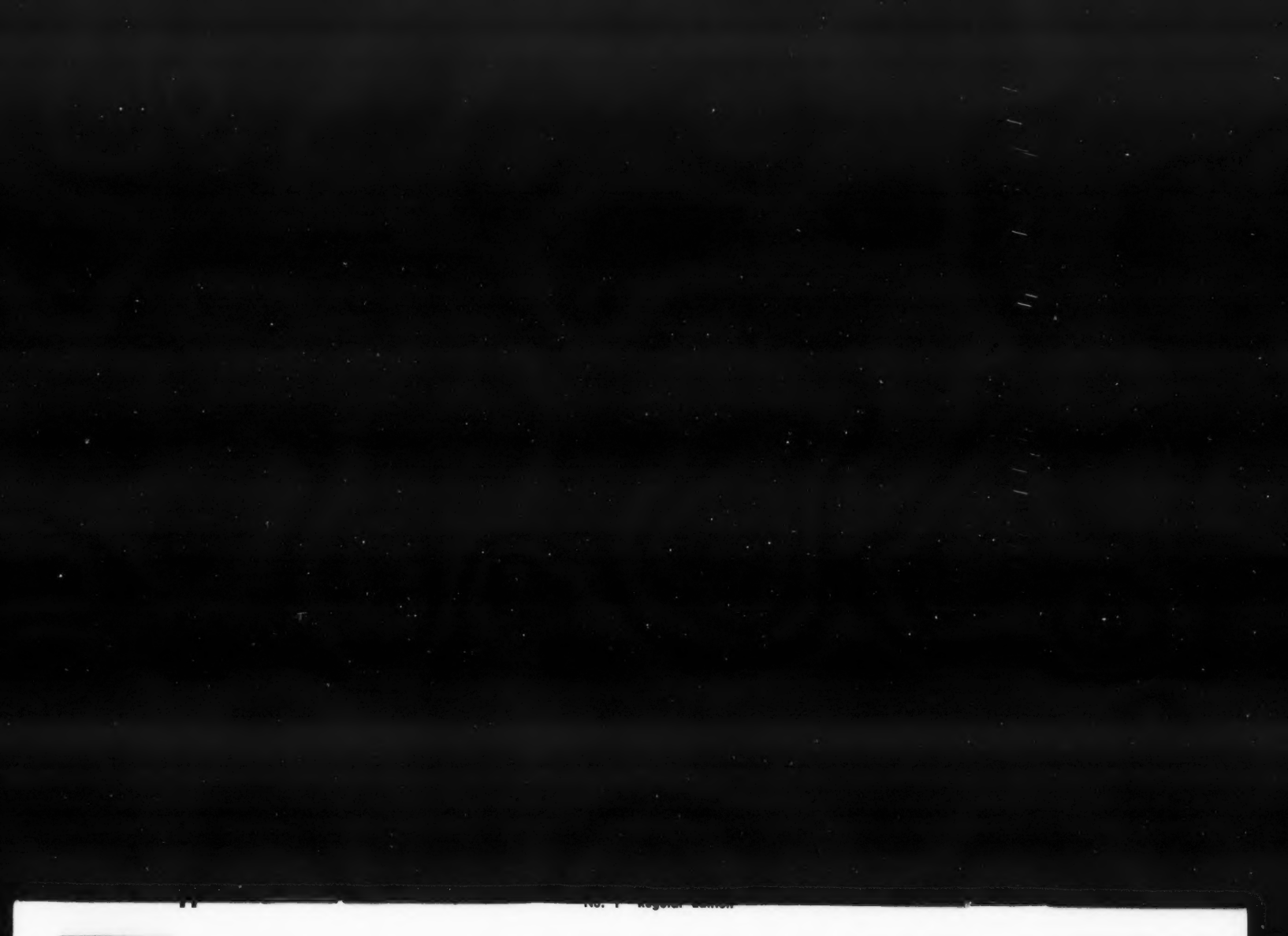
Never fly kites in the rain.

Never fly a kite with metal or wire in the frame or tail.

Never use tinsel string, wire or any twine that has a metallic substance.

If the kite catches in a power line, let go immediately. Don't pull the kite or climb the pole!

National 4-H Club Week will be observed March 1-8 by over 2,200,000 4-Hers in 90,450 clubs. Uniting Head, Heart, Hands and Health, they work for things that create a nation of peace, strength and progress.



Printed Patterns

9219—Make two versions from one Printed Pattern—raglan-sleeve style for now; halter style for summer. Child's Sizes 2, 4, 6, 8, 10. Size 6, raglan sleeve, takes 2⅝ yards 35-inch fabric.

9148—Princess dress with side buttoning, designed to slim the larger figure. Printed Pattern in Women's Sizes 36-48. Size 36 takes 4⅞ yards 35-inch fabric.

9238—Summer classic with buttoned bodice, convertible collar, graceful skirt. Printed Pattern in Misses' Sizes 12-20; 40-42. Size 16 takes 4 yards 35-inch.

4724—Half-size fashion with simple bodice, 6-gore skirt—sew-easy with our Printed Pattern. Sizes 14½-24½. Size 16½ takes 3⅛ yards 39-inch.

9110—Scoop-neck sundress with smartly collared bolero. Printed Pattern in Misses' Sizes 12-20. Size 16 dress and bolero require 4⅝ yards 39-inch fabric.

4580—Princess sundress for the half-sizer with button-front princess jacket. Printed Pattern in Sizes 14½-24½. Size 16½ dress takes 5¼ yards 35-inch fabric; jacket 1½ yards.

4715—At last a bra that really fits you and gives firm, comfortable support. Printed Pattern in Misses' and Women's Sizes 32-38; 40-46. Size 36 long bra takes ⅞ yard 35-inch fabric; regular, ½ yard.

Send THIRTY-FIVE CENTS (in coins) for EACH pattern to:
ELECTRICITY ON THE FARM, P. O. Box 42, Old Chelsea Station, New York 11, New York
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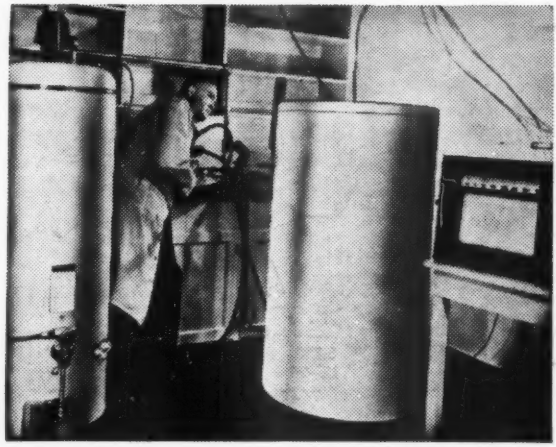

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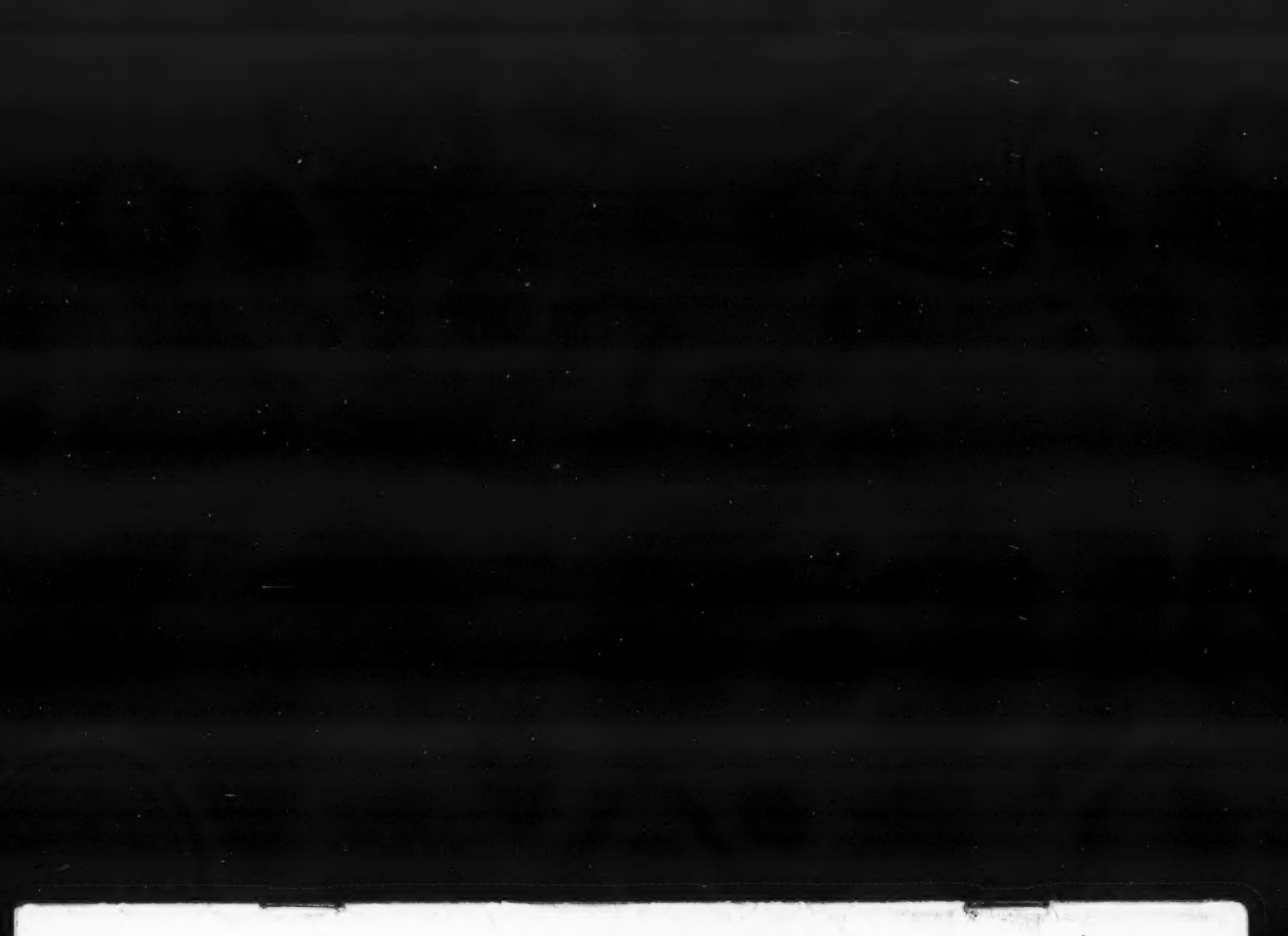
We send this magazine to you regularly to help you keep abreast of new developments in farm electrification that save time, work and money.